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The Chronology of Prehistoric India:
From earliest times to the Iron Age
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The Chronology of Prehistoric India: From Earliest Times to the Iron Age

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Several general treatises on the chronology of prehistoric India already exist (see Lal 1963; Mandal 1972; Agrawal and Kusumgar 1974, 1979; Ramchandran 1975), and most of the recent general works on the prehistory of India and the other South Asian countries contain lists of radiocarbon dates (see B. Allchin and R. Allchin 1968, 1982; Fairservis 1971, 1975; Sankalia 1974; Possehl 1979; Agrawal 1982a and 1982b).

The geographic scope of this chapter is for the most part restricted to the consideration of prehistoric materials that come from the modern nations of India and Sri Lanka (figs. 1, 2, and 3). Prior to the partition of the South Asian land mass, sometimes referred to as the subcontinent, there was little ambiguity in the meaning of the word *India*. The creation of Pakistan in 1947, as well as independent Bangladesh, Burma, and Sri Lanka, however, demands that we use a vocabulary that is more explicit. In this chapter, *India* thus designates the modern nation state of the same name. *Ancient India*, the *subcontinent*, and *South Asia* refer to the former encompassing geographic entity.

The chronology of the prehistoric eras of the subcontinent has reached a point where some of the gross outlines of time/space relationships are beginning to emerge. This is due to the advances in radiocarbon dating, in terms of both the number of dates and their quality. Despite this progress we still cannot present a coherent chronology for all regions of India during all of the prehistoric eras. A few regions are reasonably well known through all or most of these millennia, but most of the outline is a variable mosaic with quite different qualities. In some instances only one period is known for a region. Such is the case, for example, in Gujarat state in which the Bronze Age Harappan occupation floats in a context of almost totally unknown eras prior to and following it. Although the resulting picture may be marked by more unevenness of chronological insight than by clarity, there remains a great deal that can be said.

A few words on the major gaps in this picture are in order, for they will be largely passed over in the body of the text. Northeastern India, including the mountainous states of Sikkim, Assam, Meghalaya, Arunachal Pradesh, Nagaland, Manipur, Mizoram, and Tripura, is a virtual blank for prehistoric chronology. The same is largely true for the deep south of the peninsula, especially Kerala. But these gaps in our knowledge are useful

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to prehistorians since they clearly mark areas within which they can carry out productive research, the results of which could yield important insights beyond the chronological information that is the focus of this essay. For example, the mountainous states of India's northeast have been thought by some (Sauer 1969; Gorman 1969, 1971) to be areas for understanding the origins of food production in monsoon Asia. Little-known Orissa and Bihar are mineralogically rich and may have played significant roles in the development of major technological innovations, especially metallurgy.

Little is said of the Harappan Civilization in this essay. Our colleague Jim Shaffer has covered this topic in his contribution to this volume (chap. 26). We do have a few things to say about the Gujarati aspect of the Indus Civilization, but principally as it impinges on an understanding of what is going on in surrounding regions during the second and third millennia B.C. Even though it penetrates deep into India the interesting Harappan material in northern Rajasthan, Punjab, Haryana, and western Uttar Pradesh will be no more than mentioned, and then only in reference to other chronological issues.

Sites mentioned in this text have been located on a series of maps accompanying the text. These are nowhere near a comprehensive set of documents. The map coverage for prehistoric India is quite uneven. Most of the site reports have some kind of orientation map, at least for the individual site. These are useful, but tedious to employ. (Good map coverage for larger bodies of material can be found in Joshi, Madhu Bala, and Jassu Ram 1984; Schwartzberg 1978; and Sankalia 1974).

The present mosaic of regions and chronology inevitably fails to give a satisfying sense of knowing the subcontinent in prehistoric times. Nonetheless, the past fifteen years have seen giant strides forward in our understanding of prehistoric India, and it is around these accomplishments that one can develop a thesis. By focusing on these achievements this presentation also takes on a natural structure, for we can discuss particular chronological topics in some detail, rather than having to present a less meaningful miscellany. One area of such progress is in the chronology of the Indian Paleolithic.

The Chronology of the Paleolithic of India

The Lower and Middle Paleolithic

We can present one radiometric date for the Lower Paleolithic of India. This is a thermoluminescent determination from the Sihawal Formation near Baghor II in the Son Valley of northern Madhya Pradesh (fig. 4) at 103,800 ± 19,800 B.P., Alpha 899 (Clark and Williams 1986). This date comes to us as a part of the interdisciplinary work conducted jointly by G. R. Sharma of the University of Allahabad and J. Desmond Clark of the University of California, Berkeley. The Sihawal formation is the oldest Quaternary formation in the middle Son Valley. It is composed of a basal conglomerate of colluvial-alluvial sandstone cobbles in a matrix of mottled gray and yellow-brown clay. The gravels contain Lower Paleolithic bifaces, some of which are relatively fresh, others of which are strongly abraded. The Cambridge University team working in the Potwar plateau of Pakistan reports a radiometric date of ca. 2 million years in association with a tool or tools (Bridget Allchin, pers. comm., 6 July 1987).

Until recently there was nothing substantial in the hominid fossil record of the Indian subcontinent (Kennedy 1973, 1980, 1984a, 1984b). However, Arun Sonakia of the Geological Survey of India has discovered parts of a fossilized human cranium in the village of Hathnora on the northern bank of the Narmada River in central India (Sonakia 1984, 1985; Kennedy 1985). This is in the vicinity of Hoshangabad (fig. 4), a region with numerous Paleolithic sites, some of which were originally studied by H. DeTerra and T. T. Patterson (1939). Sonakia's preliminary reports on this find indicate that it was found in situ associated with a Middle to Upper Pleistocene cemented gravel and conglomerate. He notes that the specimen "bears a number of similarities to Asian *Homo erectus*" (1985:615). Kenneth A. R. Kennedy has been more cautious, referring to it as "*Homo* sp. indet." (1985:615).

Uncalibrated radiocarbon dates of the Indian Middle Paleolithic are presented in table 1.

A Note on the Radiocarbon Half-life and Calibration

Dates in the body of this chapter are presented in three ways: (1) uncalibrated dates b.p. (Before Present) using the 5568 radiocarbon half-life, (2) dates given B.C. (Before Christ) calculated on the 5730 half-life, and (3) calibrated dates B.C. (Before Christ) using the unpublished 1σ tables of Klein, Lerman, Damon, and Ralph (see the appendix of this vol.; also Klein et al. 1982). Only the calibrated dates are expressed as a range.

Discussion of the Indian Middle Paleolithic

As can be seen from the dates in table 1, the Middle Paleolithic flake industries of India are spread throughout the subcontinent. Good stratigraphic successions are available at a number of sites, especially Bhimbetka, the Belan and Son Valleys, and Nevasa (fig. 4). Bridget and Raymond Allchin (1982:47–57) have noted a basic difference between the Middle Paleolithic of central and peninsular India, as compared to that of the Indus plains and the Thar Desert, north of Gujarat. In central India, extending through the Vindhyas up to the Ganges plains,

there is a strong line of continuity out of the Lower Paleolithic core biface technology. The use of Levallois technique is documented, along with other flake-producing technology. This body of material has been called the Nevasian (Sankalia et al. 1960:102–14). The Middle Paleolithic to the west of the Aravalli Hills and north of the Saurashtran peninsula is a far more diverse body of material. These industries can be divided into "lesser regional groups, and into what appear to be the outcome of a series of marked local traditions" (B. Allchin and R. Allchin 1982:51). The diversity of these industries can be exemplified by reference to the so-called Late Soan of DeTerra and Patterson (1939) as compared to that of Sanghao Cave in northwestern Pakistan (Dani 1964).

On the Son River the Allahabad/Berkeley team under the direction of G. R. Sharma and J. Desmond Clark uncovered evidence for two phases of the Middle Paleolithic. At an excavation in the Rehi Nala, a northern tributary of the Son River, they found fresh flake tools which included small subtriangular and cordiform hand axes. A later Middle Paleolithic component has been found adjacent to the site of Baghor I (fig. 4).

The age of the Son Valley Middle Paleolithic can be estimated from a radiocarbon determination taken from carbonate in the clays of Gerwa well near the Baghor sites (fig. 4), which gave an age of ca. 25,000 B.C. Since the carbonate is postdepositional, Clark and Williams (1986:30) suggest that the Middle Paleolithic may well be 40,000 or 50,000 years old in this area.

Work by Deccan College under the direction of V. N. Misra at Didwana in north-central Rajasthan (figs. 4 and 5) has yielded some further insights into the chronology of the Middle and Upper Paleolithic (dates are b.p. uncalibrated):

> A few C-14 dates on pedogenic carbonates and TL dates on fossil sand sheets of the 16 R locality at Didwana indicate that the Middle and Upper Palaeolithic industries (there) date to around 100,000 B.P. and 20,000 years B.P. respectively. The region seems to have been deserted during the terminal Pleistocene (ca. 20,000–10,000 B.P.) due to intensely arid climate when the dune building activity was strong and the lakes became saline. High fresh water lake levels during 6,000–4,000 B.P. suggest considerable increase in rainfall when Mesolithic populations flourished throughout the desert. (Misra and Rajaguru 1984)

The Indian Upper Paleolithic

Indian Upper Paleolithic blade and burin industries are just emerging as reasonably well defined entities. The key sites and radiocarbon determinations can be found in table 2. Critical works on this material are by Paddayya (1973), Allchin, Goudie, and Hegde (1978), G. R. Sharma et al. (1980), and G. R. Sharma and Clark (1983).

The stratigraphic order of the Indian Middle Paleolithic, of the blade and burin industries of the Upper Paleolithic, and of the widespread Indian microlithic industries has been established at Bhimbetka (Agrawal 1982a:31–49), in the Belan Valley (Sharma et al. 1980), and in the Son Valley as well (G. R. Sharma and Clark 1983; Clark and Williams 1986).

The Upper Paleolithic of the Son Valley

Three Upper or Epipaleolithic sites found by the Allahabad/Berkeley team in the Son Valley may be mentioned here. At Rampur, not far from the Baghor sites in figure 5, an industry of small blades and burins is associated with Beta-4792, 9920 ± 120 B.C. It is also likely that there is an association between such diminutive tools and Beta-4793, 24,300 ± 420 B.C., at the base of the Baghor formation at Rampur (Clark and Williams 1986:30).

At Baghor III on figure 5 (Clark and Dreiman 1983; Clark and Williams 1986), tools similar to those at Rampur were found: small blades of near microlithic proportions, retouched blades in the form of triangles, awls, borers, lunates, and so forth. The excavators use the dates from the Rampur area to infer a date for Baghor III, rather than PRL-714, 4710 ± 180 b.c. (5575–5210 B.C.).

Baghor I (fig. 5; Kenoyer et al. 1983b; Clark and Williams 1986) is apparently somewhat later than Rampur and Baghor III. It is a multiactivity site that may be remarkably preserved. Tools include an assortment of blade types as well as triangles and awls. Location and typology strongly suggest to Clark and Williams (1986) that Baghor I belongs to the period between the Rampur/Baghor III assemblages and the Mesolithic site of Baghor II (see figs. 7, 8 and below).

A shrine at Baghor I may indicate an astoundingly long period of cultural continuity in the Vindhyas, possibly extending from 10,000 B.C. to the present (Kenoyer et al. 1983a; Clark and Williams 1986).

Upper Paleolithic Phase in the Belan Valley

Another insight into the Indian Upper Paleolithic may be derived from the cemented gravels below the Neolithic mound of Mahagara (fig. 5) (G. R. Sharma et al. 1980). The Allahabad team obtained two radiocarbon determinations for the lowest Gravels III, with a purely Upper Paleolithic tool industry. These determinations (TF-1245 and PRL-86) give a tentative date for this formation at ca. 24,000 to 17,000 B.C. This is in general agreement with the dates that the Allahabad/Berkeley team reported from the Son Valley. The possible presence of sheep and/or

goat remains in these gravels is potentially of great significance and is discussed below.

The Transitional Phase of Cemented Gravels IV at Mahagara

Mahagara Cemented Gravels IV, with the beginnings of the microlithic tool-making technology, as well as more sheep/goat remains, has five radiocarbon determinations, although two of them come from shell. The consistency of these dates (see Mahagara Gravels IV in table 2), which range from ca. 12,000 B.C. to 8,000 B.C., are important since this chronology is consistent with the dates for similar materials at Baghor I and III. It is clearly too early to begin to draw conclusions about chronology, but the dates in hand offer a sound start.

Faunal Remains from the Mahagara Gravels III and IV

The presence of sheep/goat remains at Mahagara from Upper Paleolithic times through the Neolithic is extraordinary. If the identifications are correct the animals must have been domesticated to be even present there.

Zooarchaeologists have developed several criteria to assist them in judging whether animals in a particular collection are domesticated or wild. S. Bökönyi gives six of these (1969:221). For him one of the surest ways to establish domestication is to find a situation in which "species appear that have no wild ancestors in that particular region, at least since the Pleistocene" (1969:221).

The wild sheep and goat populations nearest to Mahagara are in the Himalayas, 250 miles to the north, or in the mountains of Baluchistan and Afghanistan, 1,000 miles to the west. There is no reason to believe that these ranges were significantly different in the early Holocene. This information is available in some detail in Ellerman and Morrison-Scott (1966) and has been summarized in Schaller (1977:45–82). These distances are considerable and in both instances involve the crossing of major riverine systems, the Indus or the Ganges, for the animals to have reached Sharma's site.

K. R. Alur's preliminary report on the faunal remains (Alur 1980) indicates that there was a reasonable amount of sheep/goat material, even in the Upper Paleolithic. He reports the presence of molars, mandibles, and metacarpal condyles of these animals. All of these are identifiable body parts. The mandibles and metacarpal condyles even offer the opportunity of differentiation between sheep (*Ovis*) and goats (*Capra*).

The potential importance of these materials is very great, for we are dealing with the possibility of domestication at a very early date, perhaps prior to 20,000 B.C. However, the research in and around the Belan Valley is still in a very early stage, and the ambiguities probably reflect problems inherent at the beginning of any large research program.

Industries of the Holocene

Microlithic Technology in the Holocene

The Mahagara Gravels IV indicates that there may be a gradual transition between the Upper Paleolithic blade industry and the maturity of a full microlithic technology. This is also true at other sites: Chopani Mando I (fig. 6; G. R. Sharma et al. 1980:36) and Baghor I (fig. 5) on the Son River. Typologically the microlithic industries of India appear to be remarkably similar to those of the Near East and Europe. The general types, including crescents, lunates, trapezoids, triangles, backed blades, microburins, fluted cores, and the like are certainly shared.

Integrated microlithic tool kits have a very long history in India and surrounding countries. Early dates at ca. 25,000 and 20,000 B.C. have been very recently reported, and not fully evaluated, for the site of Batadombalena Cave in Sri Lanka (Deraniyagala 1984 and below). Baghor II in Madhya Pradesh has the following uncalibrated date: PRL-715, 6380 b.c. Other sites may date to the Medieval period. Table 3 lists dates available from microlithic sites. These have not been differentiated from one another in any significant way because this introduction is intended only to give a sense of the geographic range for microlithic technology in India and the period of time involved. Site locations are found on figure 6.

Sites with Microlithic Technology

The dates in table 3 give a summary of sites in India with a predominantly microlithic industry and some chronological control. The dates are wide ranging, from 10,000 B.C. to medieval times. Some sites have clear associations between Chalcolithic or Iron Age pottery and the small stone tools. Bagor in Rajasthan (V. N. Misra 1973a) is one of these, and Langhnaj is another. Jerome Jacobson worked on a complex of sites in Madhya Pradesh with these kinds of associations (Jacobson 1970:396–423). The rock shelter/cave complex at Bhimbetka is another astoundingly rich area.

Microlithic tools with the specific typological attributes noted above were made in peninsular India well into historic times by substantial numbers of people. A warning must be noted about the use of the terms *microlithic* and *mesolithic*. In many instances an author is attempting only to convey a sense that the industry is composed of small stone tools. There are a number of such diminutive industries. One of these is the Chalcolithic short-blade industry associated with sites of the Post-urban Phase of the Harappan Civilization in Gujarat. Fine examples of "true" microliths survive into historical pe-

riods in India, just as they apparently did in other parts of the world (B. Allchin 1966:26, 35, 49). Jacobson (1970:22) has noted that there have been reports from India of microliths made from bottle glass (B. Allchin 1966:102; Gordon and Gordon 1943:95; Todd 1939:42). None of these comes from reliable contexts, but given the other evidence it is not impossible that microliths were made from such material.

Three Aspects of Indian Microlithic Sites

The Mesolithic, Early Food Production, and Interactive Trade and Barter

The different contexts of microlithic technology in India are important since each has some chronological significance. A discussion of this can begin with a consideration of three different forms of settlement and subsistence that have an association with a microlithic stoneworking technology: the Mesolithic aspect, the Early Food-Producing aspect, and the Interactive Trade and Barter aspect.

Sites of the Mesolithic aspect generally occur in small caves and open settings. Tools are frequently abundant and associated with the remains of wild mammals, shells, and an occasional ground stone implement. Ring stones or "maceheads" are the most common of the latter type.

The *Mesolithic* is a much abused concept. We understand that the term is properly used to refer to Old World archaeological assemblages that fall within the Holocene and lack evidence for food production or an accommodation with surrounding food-producing peoples. In India Mesolithic peoples made proper microliths: lunates, crescents, triangles, microblades, and the like. But it is also true in India that many people who ought not to be called Mesolithic made such tools. There is no necessary correlation between these tools and a particular form of settlement and subsistence. Confusion over the definition of the Mesolithic—settlement and subsistence versus typology—has muddled much writing on Indian sites with microlithic technology. Some authors seem to imply, or even state, that if a tool assemblage contains microliths it is thereby "Mesolithic" by definition. We feel that this equation has little utility since it raises questions such as the percentage of microliths necessary to classify a body of material as "Mesolithic." Also, it may bring very diverse assemblages into conjunction. Is the Harappan village of Allahdino a Mesolithic site because it has a few microlithic tools? (Hoffman and Cleland 1977). Third, and most important, a focus on typology may actually mask the rich, historically significant aspects of the peoples who made and used these tools. As will be seen, these folk were involved in a diversity of sociocultural settings and economic activities. They were, in fact, playing key roles in regional economies. Dwelling on tool typologies is not likely to be the most profitable way to understand these aspects of the human career.

In this essay, *microlith* and *microlithic* refer to tools that were made by some of the diverse communities of ancient India. The tools themselves are of limited importance to understanding the sociocultural and economic settings of these peoples. They are, however, a kind of proxy that allows us to communicate efficiently about this diverse class of archaeological data.

Microlithic tool technology was employed by many peoples involved with the development of food production in India. This can be seen at places like Koldihwa or the Mahagara Neolithic (see below) where there is evidence for some attention being devoted to cultivation. However, another process, especially in western India, involved the integration of domesticated animals, principally sheep and/or goats, into economies that would otherwise be classed as hunting and gathering. The later history of these peoples seems to have involved increasing sedentism in some cases, leading to the establishment of village farming communities. A certain amount of indigenous "experimentation" with the control and increased productivity of local flora and fauna may also be a part of this story.

Sites of the Interactive Trade and Barter aspect have the classic microlithic technology associated with variable faunal and floral assemblages. At times domesticated plants and animals are a part of the picture, although this is not exclusively the case. Of interest in sites of this aspect is the presence of technologically sophisticated materials such as copper/bronze, iron, and glass. Other materials such as carnelian beads, sea shells, and steatite also occur. Coins are known from some of these sites. Pottery is generally present and usually can be tied to the ceramics of surrounding village farming communities. Trade and interaction between these sites and surrounding communities, at times some distance away, can be inferred from these ceramics and the known source areas for the "exotic" materials found at these small settlements.

Microliths are also found in many of the early village farming communities throughout the subcontinent. But a more frequent stone tool manufacturing technology is one based on the crested guiding ridge and the production of long "ribbon" blades. Cores produced by crested ridge technology are rare in sites of any of the Microlithic aspects.

Chronological Significance of the Three Aspects of the Microlithic

There is much misunderstanding concerning the date and nature of sites with microlithic assemblages. Some of the most recent reconstructions of India's past (e.g., Sankalia

1974; Fairservis 1975; Agrawal 1982a) confront one with the "Mesolithic" model for all of the diverse contexts in which a microlithic technology occurs in India. Implications that the dates at hand are incorrect are themselves in error, for a satisfying model of prehistoric life in India can be generated which encompasses both the available chronological information and the material culture.

A Survey of Sites with Microlithic Technology

Of the many sites in India with a predominantly microlithic technology, few are adequately reported and fewer still have been excavated (see fig. 6). It is therefore impossible to determine where most of them would fit within our tripartite typology. A broad survey of these sites is called for, nonetheless, if only because it is possible to estimate the dates for some of them.

Northeastern India

One of the best known microlithic sites in India is Birbhanpur in Bengal (Lal 1958). The site has what Prof. Lal calls a nongeometric microlithic industry. Reports on flora and fauna are not available. Study of the soil and geology of the site concludes that "the geochronological evidence adduced here, although inconclusive so far as the absolute chronology of the site is concerned, places this microlithic culture in the comparatively mild and dry phase following the lateritic weathering, and though it would be difficult to fit this phase firmly into the acknowledged time-scale of climatic chronology without further geological investigation, the probability is that it may be assignable to the beginnings of the Holocene" (Dr. B. B. Lal in Prof. B. B. Lal 1958:48). A later study of the Birbhanpur soils supports this conclusion (Lal and Lal 1961).

A provocative report on a site known as Selbalgiri-2 in the Garro Hills of Assam mentions microliths in association with pottery (*Indian Archaeology: A Review* 1967–68a:7 and 1967–68b:8). Tools include lunates, trapezoids, points, and arrowheads. There is no chronological information.

Central India

In Madhya Pradesh, V. S. Wakankar and V. N. Misra have developed an archaeological sequence in the Bhimbetka area. In this hilly tract of some ten square kilometers, over eight hundred caves and rock shelters have been found. According to D. P. Agrawal (1982a:66), "most of them have habitation from Acheulian to the Mesolithic period." Some have a microlithic tool kit unassociated with ceramics and metals. In stratigraphic terms this directly follows the Upper Paleolithic of the area. Studies of the Bhimbetka fauna and flora are lamentably absent, and preservation of this material is said to be very poor (V. N. Misra, pers. comm.), but the microlithic aspect just noted is followed by strata in which microliths are associated with Chalcolithic and Iron Age pottery, metals, glass, and other materials associated with the historical ages (Wakankar and Brooks 1982; V. N. Misra, Nathpal, and Nagar 1977). The dates for Bhimbetka on table 3 do not allow us to discriminate between these various associations at the site complex. Moreover, one of the excavators, V. N. Misra, has expressed some doubt about the quality of some of the samples (V. N. Misra in Agrawal et al. 1978:235).

Bombay

Farther south, in the region around the present city of Bombay, there has been some exploration, but little systematic excavation. K. R. U. Todd pioneered the archaeological work in the area (Todd 1939, 1950). He was followed by S. C. Malik (1959) and D. P. Agrawal and S. Guzder (1972). Bridget Allchin (1966) has also summarized much of the material. The significant sites are Pali Hill near Bandra and Yerangal Point, both on Salsette Island, now incorporated into the Bombay peninsula (Todd 1950: fig. 1; Malik 1959:27).

The shores of Bombay, once a chain of islands connected by tidal flats, must have been an exceptionally rich and attractive environment for a hunting and gathering population, and many of the sites from this area may relate to the Mesolithic aspect, but studies of fauna and flora are wanting. There are no absolute dates for these sites, although D. P. Agrawal has suggested an early chronology for some of them. It seems, he observes, that there are no sites between present sea level and +5 m. This suggests that coastal sites were destroyed by mid-Holocene sea levels which were much higher (Agrawal, Avasia, and Guzder 1973).

Some of the sites on Salsette Island also relate to other aspects of the Indian microlithic. For example, a wide range of beads including agate, carnelian and jasper, some of which may have been etched, were reported from Pali Hill, Yerangal, Hog Island, and some other sites (Todd 1950:7).

South India

In the deep south of peninsular India, a number of sites seem to relate to the Mesolithic aspect of the microlithic tool-making tradition. In Karnataka, formerly Mysore state, the site of Sanganakallu (Sankalia 1969; Ansari and Nagaraja Rao 1969) has been well excavated. Based on the stratigraphic position of the microlithic industry there and some soil analysis, Sankalia (1974:246) has suggested that it dates broadly to between 9,000 and 3,000 B.C. The same may be true for Kovali in Bijapur District

of Karnataka (Pappu 1970, 1974:264). Over thirty sites with microlithic industries are known from the Shorapur Doab in Karnataka (Paddayya 1973). There is no way to date securely all of them or to know whether any of the inhabitants were raising domesticated animals, but some of the settlements are stratified under the Southern Neolithic. This indicates that the tools predate the middle of the third millennium B.C. (see below for the chronology of the Southern Neolithic).

The broadly conceived investigation of the famous site of Nagarjunakonda (Subrahmanyam 1975:46–71) also produced evidence that people made and used microlithic tools there. There are two specific localities, plus a number of surface collections, on which there are full reports, although fauna and flora are omitted. Once again the microliths, at least in part, predate the introduction of pottery and the Southern Neolithic.

In Tinnevelli District of Tamil Nadu (Madras), eleven microlithic sites have been located on the sea coast, among dunes and coastal shallows. The following are the most important: Megnanapuram, Kuttampuli, Kuthankuli, Sawyerpuram, Kattalankulam, Kullatur, and Puttan Taruvai (Sankalia 1974:241; Zeuner and Allchin 1956). The sites are on either side of the mouth of the River Tambrapani in red-weathered sand dunes known in Tamil as *teris*. The dunes have been studied by Frederick Zeuner, Bridget Allchin, A. V. N. Sarma, and a team led by D. P. Agrawal. Thus we now have some dates for the various sea terraces and some idea that these sites were occupied during the early Holocene. Sarma's publication (1976:186–90) has a fine discussion of the dates themselves. D. P. Agrawal has the following to say about the chronology of the *teri* sites:

> Due to older transgressions of the sea, there are three terraces of sand dunes at 1.5 m, 6 m, and 15 m quite inland from the present day coast. The dunes obviously must have formed during arid conditions, but man occupied them only during wetter conditions as indicated by weathering and the sand. Even the microliths are stained red by the hydrated ferrix [*sic*] oxide, a product of weathering. Zeuner assigned the 6 meter terrace, from which most of the microliths derive, to ca. 4000 B.C. (Zeuner and Allchin 1956). We have 14C dated the +5 m sea level transgression for the western coast of India to ca. 5000 B.C. (Agrawal and Guzder 1972). On the eastern board [of India] also a large number of samples were dated which confirm this date, but no report has come-out yet. (Agrawal 1982a:75).

Sri Lanka

A few words about Sri Lanka are in order here, since South India has just been mentioned. First, a well-formed microlithic tool kit has been documented at Batadombalena Cave (also known as Batadomba). This may be as early as 28,000 B.C., well before this technology appears elsewhere in the world (Deraniyagala 1984:107). This very early date may be corroborated by a TL date of 26,000 B.C. for ancient sand dunes at Bundala, Sri Lanka, in which microlithic tools also have been found (Deraniyagala 1984:105). At Beli-lena Kitugala the claim has been withdrawn for a microlithic industry dating to as early as 10,000 B.C. associated with "possibly domesticated cereals" (Agrawal, Krishnamurthy, and Kusumgar, in press: 3) or the seeds of millets (Protsch and Weninger 1984:194). S. U. Deraniyagala has informed the authors that the dates are seemingly acceptable but that the seeds have "been conclusively identified by M. D. Kajale as granules from the charred epicarp of the edible wild breadfruit *Artocarpus nobilis*" (Deraniyagala, pers. comm., 1985).

Beli-lena Athula, another site with microliths, has a date of TF-1094, 6420–5420 B.C. Wild seeds and fruits have been reported there (*Indian Archaeology: A Review* 1980–81a:110). The site of Bellan Bandi Palassa has a thermoluminescence date of 4550 ± 700 B.C. from fired rock crystal (Wintle and Oakley 1972). So little is known of this site that it is difficult to fit it into a larger scheme.

There is considerable archaeological research taking place in Sri Lanka. We are confident that in the not-too-distant future a great deal more will be known about its prehistory.

The Mesolithic Aspect

The Belan and Son Valleys

For approximately ten years G. R. Sharma, of the University of Allahabad, developed a program of exploration and excavation on the southern edge of the Ganges alluvium, including the flanks of the Vindhyan Hills to the south. Much of this work centered on the valleys of the Belan and Son rivers, which enter the Ganges Valley from the state of Madhya Pradesh (fig. 7). Several important sites were also found on the Gangetic plain itself. The Allahabad team was joined by a group from the University of California, Berkeley, headed by J. Desmond Clark. (Reports are available in G. R. Sharma et al. 1980, and G. R. Sharma and Clark 1983.)

Foundations in the Mahagara Cemented Gravels III and IV

We have already noted that the Allahabad team's dating of the Mahagara Cemented Gravels III, with Upper Paleolithic tools, to ca. 24,000–17,000 B.C., is a reasonable conclusion. It is also congruent with research in the Son Valley.

The Mahagara Cemented Gravels IV, with the beginnings of the microlithic tool-making technology, has five radiocarbon determinations, two of them from shell. Their consistency, which ranges from 12,000 B.C. to 8,000 B.C., is important for judging their reliability, and for their general agreement with the date from nearby Baghor II.

The Allahabad/Berkeley team also worked in the Son River valley, not far from the Belan. They discovered a number of sites that document occupation in the area from Lower Palaeolithic times on. One of these is known as Baghor II.

Baghor II

Baghor II sits on a ridge of Late Pleistocene alluvium known as the Baghor formation (Sussman et al. 1983:161). Microlithic tools and other debris are well concentrated on its surface. In 1980, excavations there uncovered a single component settlement that apparently was used repeatedly by a hunting-and-gathering population. A single radiocarbon determination calibrated at 8645–7645 B.C. (PRL-715) supports the team's contention that the site is early. Unfortunately the fauna was not well preserved, and no flora has been reported. The excavators summarize this extremely important site in the following way:

> Baghor II is a primary context early Mesolithic habitation site occupied during the early Holocene on a repeated semi-permanent basis. The lithic assemblage is fully microlithic, characterized by an informal and numerically minor shaped tool component which, despite the unprecedented presence of geometric microliths in similar assemblages from the middle Son and adjacent regions, places the Baghor assemblage in an early phase of the Indian Mesolithic tradition. (Sussman et al. 1983:186)

Baghor II is one of the best possibilities in India to be a true "Mesolithic" site, even though there is only one radiocarbon determination. As the excavator's narrative makes clear, the tools are typologically appropriate to this determination.

Ghagharia Rock Shelter

Four kilometers east of Baghor I is Ghagharia rock shelter, one of four in the vicinity. Tools in the basal levels are much like those of Baghor II (Clark and Williams 1986). There is a later "Mesolithic" which follows stratum I and is in turn followed by Neolithic, Chalcolithic, and Iron Age levels.

The Allahabad University Sites

G. R. Sharma's team has excavated four sites that may have the same "Mesolithic" character noted at Baghor II: Sarai Nahar Rai, Mahadaha, Chopani Mando Period I, and Lekhahia I, Phase Two. The Sharma publication (G. R. Sharma et al. 1980) presents various aspects of these sites as techno/typological equivalents, although at one point they suggest that Mahadaha is slightly later than Sarai Nahar Rai (Sharma et al. 1980:117).

Sarai Nahar Rai

This site is located on the alluvium of the Ganges, on the shores of a now dry oxbow lake 15 km southwest of Pratapgarh in Uttar Pradesh. It is presented as a single occupation settlement of approximately two thousand square meters (Agrawal 1982a:167). Fragmentary architecture, in the form of hearths and floors surrounded by postholes, marks the habitation (Sankalia 1974:239; G. R. Sharma 1973:139–41). Agrawal reports the presence of bones of sheep, goats, buffalo, cattle, and elephants (1982a:67). Thirteen burials were found within the settlement, their heads pointing to the west. This population is reported to have been very tall, with some men and women over six feet in height (Kennedy 1984). Two dates from Sarai Nahar Rai are calibrated to 1140–854 B.C. and 8900–7900 B.C. (table 4).

Mahadaha

Mahadaha, also near the shores of a former oxbow lake on the Ganges alluvium, is 31 km northeast of Pratapgarh in Uttar Pradesh. A summary of the site can be found in G. R. Sharma et al. (1980:77–131). There are three areas: a "Lake" area, a Butchering Complex, and the Cemetery/Habitation area.

The "Lake" area seems to have been a trash dump, active when the oxbow lake near the habitation was at a higher level. It was rich in microliths, querns, rubbers, burnt clay lumps, ochre, and the like, as well as the bones of sheep/goats, cattle, gaurs, hippos, antelopes, deer, turtles, birds, and fish.

The Butchering Complex was littered with animal bones, some with signs of cutting. Bone and antler tools and ornaments, some in the process of being fashioned, were found here. There is apparently little difference between the "Lake" area and the Butchering Complex in the species represented.

The Cemetery/Habitation area contained fifteen graves with seventeen individuals. Grave goods included microlithic tools, bone points, and bone ornaments. Sixteen hearths complement the interments in this area and suggest additional functions for this portion of the site. Dates

for Mahadaha are given in table 4. The calibrated range for three dates is 1385–885 B.C. and 2675–2515 B.C.

The Allahabad team's arguments for accepting the very early chronology for Sarai Nahar Rai and Mahadaha are based on the typology of the material culture. The dates, and their internal inconsistency, argue against this. What we may have, for Mahadaha at least, are signs of the kind of accommodation between a hunting-gathering population and later food producers that have been suggested for the Interactive Trade and Barter aspect of the Indian Microlithic tradition.

Lekhahia I

Lekhahia I is located on the Kaimur River in Mirzapur District of Madhya Pradesh, some 19 km southeast of Mahagara. (For the best summary see Sankalia 1974: 237–38.)

The site has been divided into four phases, each apparently with two "natural" layers. Uppermost Phase Four is the latest material.

Phase Four (Layers 1 and 2). This stratum contains geometric microliths and pottery. The tools are reduced in size from those of Phase Three.

Phase Three (Layers 3 and 4). The tool industry of this phase consists of geometric microliths, including triangles and trapezes. Pottery includes dull red and dull gray wares, at times impressed. The impressed pottery is said to be identical with that from the Mahagara Neolithic (G. R. Sharma et al. 1980:137). Calibrated date TF-417, 2135–1755 B.C., comes from Phase Three (see table 4).

Phase Two (Layers 5 and 6). Geometric microliths are found in Phase Two. There is no pottery.

Phase One (Layers 7 and 8). The lowest phase has nongeometric microliths and Upper Paleolithic tools, but no pottery. There is one radiocarbon determination: TF-419, 3035–2780 B.C. (table 4).

There are no reports on animal bones from Lekhahia I.

Chopani Mando

Chopani Mando is a three-period site on the floodplain of the Belan Valley, 77 km southeast of Allahabad City. It is approximately 150 by 100 m. The excavations there are summarized in Sharma et al. (1980:33–76).

Period III. The latest period at the site is called Protoneolithic or Advanced Mesolithic. Up to thirteen round or oval huts were found along with four hearths. The floors of the huts were "littered with a large number of microliths and stone pieces" (Sharma et al. 1980:37). Fragments of flat querns, mullers, and ring stones occurred with redware pottery.

G. R. Sharma reports that from Period III come the bones of cattle and sheep/goats as well as carbonized wild rice (Sharma et al. 1980:75).

Period III is the only occupation with ceramics. These include a Red Ware, and a Khaki or Brownish Gray Ware. Some of these sherds are decorated with a set of impressed designs (Sharma et al. 1980:65–68). While these designs differ in detail from the ceramics of the Vindhyan Neolithic (see below), the tradition of decoration is the same. The agreement between radiocarbon determinations for the Vindhyan Neolithic and BS-129, at 3385–3135 B.C. (table 4), for Chopani Mando III may thus be significant.

Period IIB. Subperiod IIB contains geometric microliths which are said to be nearly identical with those from Sarai Nahar Rai (G. R. Sharma et al. 1980:71–72). There are five circular huts. The animal bones were too fragmentary for identification.

Period IIA. Subperiod IIA is an earlier architectural level with two huts like those of IIB. Nongeometric microliths are also reported.

Period I. This earliest settlement at Chopani Mando is termed Epipaleolithic. The tool assemblage contains two aspects: one with thick, broad, elongated blades, points, and scrapers and the second with tools like those just noted, but smaller. On the basis of typological similarities to Mahagara Gravels IV, Sharma and his team date it to ca. 17,000 B.C. (Sharma et al. 1980:72).

Early Food-Producing Aspect

The Vindhyan Neolithic

Important evidence relating to the beginnings of sedentism and food production in northern India comes from recent work in the Belan and Son valleys. Taken together this material forms a distinctive cultural assemblage that can be called the Vindhyan Neolithic. Some consideration was given to the proper place for the presentation of this important new material when this essay was planned. The excavators who have made these discoveries have stressed two things that lead us to the present organization of our work. First, there are clear lines of technotypological continuity between Vindhyan Neolithic sites and settlements of other kinds, which can be described as Mesolithic in charactger. Second, these sites seem to contain a significant microlithic component in their worked stone inventory. Since reports on much of this work are preliminary in nature, judgments of this kind may well change in the future.

Significant chronological information on these early food producers is also in hand, thanks to J. Desmond Clark. We begin with a brief review of two sites in the Son Valley: Kunjhun II and Kunjhun River Face.

Kunjhun II

At Kunjhun II the Allahabad/Berkeley team found an eroded settlement with cord-impressed pottery, dished grinding stones, and stone axes (Clark and Williams 1986). The cord-impressed pottery is quite distinctive and apparently of the type found at Mahagara and Koldihwa (G. R. Sharma et al. 1980: pl. MGR.XII and XIII). It may also have a typological relationship to the ceramics of Chopani Mando III (see above). In any event, it is now seen as an important marker for the Vindhyan Neolithic.

Excavations at Kunjhun II produced evidence for the heat treatment of chalcedony, agate, and chert. Heat-treated nodules were worked into tools on the spot. Kunjhun II was also a butchering station as shown by a good collection of large mammal bones, some of which had been split to retrieve the marrow. The animals included the *gaur* as well as a large- and medium-sized deer and an antelope (Clark and Williams 1986). There are a number of locations like Kunjhun II in the Son Valley.

Kunjhun River Face

A step trench at the river, 500 m north of Kunjhun II, was named Kunjhun River Face by the Allahabad/Berkeley team. The excellent collection of the Vindhyan Neolithic ceramics includes the Cord Impressed Ware, which was the most common type. Other ceramics include the Black Burnished Ware and Red Slipped Ware of the Vindhyan Neolithic. Chipped stone and faunal remains were also recovered. Three dates available from the Kunjhun River Face are in table 4 and calibrate to a range of 3530–3335 to 1565–1265 B.C.

The dates and material from Kunjhun River Face are very much in keeping with the material from G. R. Sharma's Neolithic site at Mahagara in the Belan Valley.

Mahagara Neolithic

Situated in the Belan Valley 3 km southwest of Chopani Mando is the Neolithic habitation mound of Mahagara. It will be recalled that this site sits on Gravels III and IV of the Belan Valley. (The best summary of Mahagara is found in G. R. Sharma et al. 1980:133–200.)

The site has 2.6 m of habitation debris and as many as seventeen stratigraphic levels. Architecture is represented by floors 4.3–4.6 m in diameter, surrounded by postholes. The huts were arranged in curvilinear patterns, not in lines. A cattle pen was also located (G. R. Sharma et al. 1980:146). Pottery includes the distinctive Cord Impressed Ware, Burnished Red Ware, Burnished Black Ware, and a Rusticated Ware. Ground stone querns, mullers, adzes, celts, and chisels were found. A microlithic chipped stone industry utilized chert and chalcedony.

Rice is reported from the Mahagara Neolithic, but the publication on the site (Sharma et al. 1980:182) does not state clearly that it is domesticated. K. R. Alur's report notes the presence of sheep/goats, cattle, horses, deer, and wild boars. The sheep/goat remains are all from domesticated stock. Alur considers the cattle bones to be generally the remains of domesticated animals, but some wild species also seem to be present (Alur 1980:220).

There are four radiocarbon determinations for the Mahagara Neolithic in table 4, with calibrated ranges of 1770–1545 to 1670–1375 B.C. The dates from Mahagara and Kunjhun River Face are clearly in agreement, indicating a date for the Vindhyan Neolithic at between about 4000 and 1200 B.C. This chronology also agrees with one of three dates from the site of Koldihwa.

Koldihwa

Koldihwa is ca. 85 km southeast of Allahabad on the Belan River, opposite Mahagara. It is approximately 500 by 200 m in size (Sharma et al. 1980:135). The site has three periods: Iron Age, Chalcolithic, and Neolithic.

There is no real evidence for architecture at the site, although burnt clay lumps showed the impressions of screens. The material inventory includes the Cord Impressed and associated wares of the Vindhyan Neolithic, as well as ground stone celts, a Neolithic blade industry, and microliths (Sharma et al. 1980:135). Remains of rice in pottery have been identified by Vishnu-Mittre and Tetzu Chang as domesticated (Sharma et al. 1980:135–36).

The Allahabad team has used three radiocarbon determinations to date the Koldihwa Neolithic in table 4. PRL-223, from the Koldihwa Neolithic/Chalcolithic interface, agrees with dates for the Vindhyan Neolithic from Mahagara and Kunjhun II. This strongly suggests that the two earlier dates from Koldihwa (PRL-100 and PRL-101) are either aberrant or indications of an earlier, unreported occupation at the site. The Sharma team occasionally quotes PRL-224 adjusted to 7080–6080 B.C. as a Neolithic date, but the stratigraphic association of this sample is very uncertain since it was originally published as coming from an Iron Age pit (Agrawal et al. 1977:231).

Similarities in material culture, especially the ceramics, further suggest a close temporal and cultural relationship between Kunjhun II, Kunjhun River Face, Mahagara, and Koldihwa. The presence of the Vindhyan Cord Impressed Ware at Lekhahia I, Phase Three, ties this occupation to the complex as well. Chopani Mando III, with an impressed ware and wild rice, has a radiocarbon determination that calibrates to 3385–3135 B.C., within the temporal limits of the Vindhyan Neolithic.

The Allahabad/Berkeley team has demonstrated that the Belan and Son valleys, along with the plains of the Ganges, have important material relating to the development of food production in north-central India and possibly all of Asia. The sites they excavated are rich in the sense that there is generally an architectural matrix within which artifacts can be studied and the preservation of organic material is good, possibly excellent. The strong lines of continuity are also important. Chronological relationships have been summarized in figure 8.

More on Early Food Producers and Indian Microliths

Somewhat different evidence for early food production in India comes from the site of Bagor (not to be confused with the Baghor sites discussed above) in Rajasthan and the Adamgarh complex of caves and rock shelters in Madhya Pradesh. Here the adaptations that led to a food-producing economy involved the development of a pastoral economy, with little evidence for agriculture and sedentism.

Bagor Phase I

Bagor is in Rajasthan to the east of the Aravalli Range. The site is stratified within what is now a fossil sand dune called the Mahasati Mound, which sits above the Kothari River, a tributary to the Banas. The Bagor sequence contains three phases (V. N. Misra 1973a). Lowest Phase I is a purely microlithic settlement. In Phase II the microlithic technology continues and is complemented by the introduction of copper (bronze?) tools and pottery. In Phase III the microlithic technology is accompanied by iron and glass artifacts. Only Phase I is of interest to this discussion of early domestication. Phases II and III, however, form a part of the Interactive aspect of the Indian microlithic.

Faunal remains from Phase I include a predominance of sheep/goat bones (65 percent) as well as those from the zebu, buffalo, pig, antelope/gazelle, deer, hare, fox, and mongoose (Thomas 1975). This assemblage did not change through the three phases, although the absolute number of bones declines in Phase II.

The sheep/goat remains from all three phases of Bagor are thought to have been domesticated because of their distance from native areas, the age profile of the sample, and indications of a controlled diet implied by a lack of tooth wear. The zebu (*Bos indicus*) is also thought to have been domesticated (Thomas 1975:325).

Radiocarbon dates from Bagor I (table 4) are in the main stratigraphically consistent, although all samples were taken from the carbonate fraction of bone. Calibrated they range from 5355–4955 B.C. to 3955–3775 B.C. An examination of table 4 will show that the Bagor Phase I dates are reasonably close. While further work and more dates are definitely needed from Bagor, and from other sites in the region, there is some reason to now look at the beginnings of the food-producing economy in this part of India as starting with the integration of sheep/goats, and perhaps cattle, into hunting and gathering subsistence economies in the fifth, possibly the sixth, millennium B.C. The earlier date is suggested by the work at Adamgarh Cave.

Adamgarh Cave

Adamgarh is located near the town of Hoshangabad in central India, just south of the Narmada River. The site is not far from where the archaic *Homo sapiens* was recently found. Excavations in 1960–61 by R. V. Joshi (*Indian Archaeology: A Review* 1960–61a:13; Joshi and Khare 1966; Joshi 1978) were undertaken while Joshi was with the Archaeological Survey of India. The work was published when he moved to Deccan College (Joshi 1978). The site is a complex of rock outcrops covering an area of about 12 ha. Joshi excavated eighteen separate trenches in this area. What he found is much like the evidence from Bhimbetka ca. 100 km to the north. Both the Lower and Middle Paleolithic are in strata below microlithic levels that appear to have a "Mesolithic" character. Those nearest the surface are generally disturbed to some degree and contain Chalcolithic, Iron Age, and Medieval pottery, as well as iron and glass.

In trench ADG-1 Joshi found some 30 cm of disturbed material over 50–70 cm of relatively undisturbed black soil containing a significant number of microliths. In the underlying lateritic clays were Lower and Middle Paleolithic tools. ADG-1 yielded potsherds to a depth of 85 cm. Iron extended down to 11 cm and glass bangles to a depth of 20 cm. Broken ground stone "maceheads" and hammer stones were also found.

Joshi recovered over five thousand microliths in trench ADG-10 from levels that contained neither glass nor iron. Pottery, unlike that from Chalcolithic or other known contexts, was apparently found throughout this cut, although never in much quantity (Joshi 1978:44).

Faunal remains from Adamgarh include the dog, *Bos indicus, Bubalus bubalis, Ovis vignei, Capra hircus aegagrus,* and *Sus scrofa,* as well as deer, an equid, hare, and other assorted mammals and reptiles (Bhola Nath 1967). The dog, sheep, and goat are said to have been domesticated.

The association of the microliths and domesticated animals may derive further significance from an associated radiocarbon determination of TF-120, calibrated to 6410–5705 B.C. (table 4) derived from shell taken from

ADG-10 at a depth of 15–21 cm (Agrawal and Kusumgar 1968:131–32). A second date for Adamgarh Cave is from Trench ADG-2: TF-116, calibrated to 1100–805 B.C. (table 4). This sample was taken from uncharred bone excavated at a depth of −190 cm (Agrawal and Kusumgar 1968:132). This would be within the stratigraphic contexts that yielded Middle or Lower Paleolithic tools from this cut (Joshi 1978:44). The dating team notes at the end of their report that "dating of collagen (organic fraction) from other bone from Adamgarh can alone confirm the chronology of this Mesolithic Culture" (Agrawal and Kusumgar 1968:132). To date this has not been done.

The calibrated date TF-120 at 6410–5705 B.C. (table 4) for Adamgarh is not unreasonable, if the chronology for early domesticated animals at Bagor is anything near correct. This is not to say that the chronology, even of Bagor, is secure. But it does provide a somewhat different problem orientation for future fieldwork since it is possible that central and western Indian hunter-gatherers were integrating domesticated animals into their subsistence economy as early as the sixth millennium B.C. The full exploration of this adaptation has only begun. It will, however, demand that research programs pay increasing attention to organic remains. While some faunal studies have been undertaken, flora remains are almost untouched.

Neither Bagor nor Adamgarh Cave show evidence for the use of domesticated plants, although the inhabitants of these sites seem to have integrated domesticated animals into their subsistence regime. This is not the case at all of the early, transitory sites in western India that are associated with the Indian microlithic technology. For example, a mix of plants and animals seems to be present at such sites in the Belan Valley. We believe that well conceived and executed research strategies, with the intensive use of flotation and an explicitly developed sampling strategy, would produce similar evidence in other regions of the subcontinent.

Interactive Trade and Barter Aspect

The single remaining aspect to this discussion is the relationship between these small, transitory, even ephemeral, sites and surrounding, contemporary villages and towns. The origin and development of the sedentary village farming community have not yet been addressed in this essay, but are discussed in the following section. However, by the beginning of the third millennium B.C. village farming communities are found all through western India from the Himalayan foothills south to Malwa (figs. 2, 6, and 9). These are characterized by permanent settlement, long-term storage, and a dependence on agriculture as the predominant component in the subsistence regime, although sheep/goats and cattle are present. A wide range of sophisticated goods may also be found in the towns and villages of western India at this period: copper and bronze tools, ornaments and weapons, ornaments of gold and silver, beads and other baubles fashioned from a wide range of "exotic" stones such as lapis lazuli, carnelian, agates, steatite, and rock crystal. Seashells may also be present. Not every site exhibits the entire range of materials, but their overall distribution, especially metals, is reasonably broad.

The emergence of the kind of interactive accommodation suggested here also seems to be present in the area dominated by the Vindhyan Neolithic. The mix of settlement and subsistence systems which may be present in this region after ca. 4000 B.C. is what one would expect under these circumstances of regional cultural integration (see fig. 7).

The archaeological map of western India in prehistoric and protohistoric times appears much like a mosaic of clusters of sites with several different forms of adaptation: settled farming communities, hunter-gatherers, hunter-gatherer-pastoralists, even agricultural peoples who may have been highly mobile for significant parts of the year when they relied on domesticated animals for their survival. At times these clusters of similar sites seem to be the sole occupants of a "territory." In other instances the spatial distribution overlaps with evidence for different forms of adaptation within the same region; however, the niches being exploited are distinctively different. This mosaic is, of course, incomplete. But evidence for the simultaneous existence of various forms of adaptation is compelling, in spite of the chronological ambiguities that have already been noted. It is also clear that these peoples did not live in isolation from one another. A study of the material suggests interaction and, by implication, interdependence between these variously adapted entities.

Some Evidence for Interactive Trade and Barter

Bagor Phase II

Phase II at Bagor marks the first appearance of pottery in abundance as well as the introduction of copper. The microlithic technology continues, as does the mixed subsistence system.

V. N. Misra says the following about the ceramics of Phase II:

> Some affinities are noticeable between Bagor pottery and that of the Ahar culture in Mewar . . . and the Kayatha culture of Malwa. . . . The surface treatment of the Bagor pottery is similar to that of the red ware of the Ahar culture. . . . Some of the shapes . . . are common

> to the two cultures. In decoration the Ahar pottery . . . like that of Bagor, is characterized by incised designs. . . . The presence of a few unpainted black and red ware sherds at Bagor also provides a hint of some link with Ahar. The large neckless jar at Bagor is also exactly paralleled in the period I pottery of Kayatha. (V. N. Misra 1973a:103)

The Ahar, or alternatively Banas, "culture" sites are farming settlements clustered in the Banas River valley, directly adjacent to Bagor. Kayatha sites are located slightly farther south (see Wakankar 1967: pl. 24). The Ahar sites date to 2600–1500 B.C. (see below). The relevant periods at Kayatha (I and II) and other sites in its vicinity date to 2450–1700 B.C. Citations for the comparison of the most important of these ceramics, the incised redwares, are as follows: Bagor (V. N. Misra 1973b: fig. 22); Ahar (Sankalia, Deo and Ansari 1969:77–86); and Kayatha (Ansari and Dhavalikar 1975:46, 47, 56, 57, 64, 66, 67).

The exact source of this kind of formal similarity in the archaeological record is, of course, always difficult to trace with certainty. But V. N. Misra's suggestion, that it indicates that the inhabitants of Bagor had some kind of contact with settlements of the Ahar and Kayatha Complexes, is a good one (V. N. Misra 1973b:305). Gilund, a site with the full inventory of Ahar ceramics, is only 30 km south of Bagor.

A notable feature of Bagor Phase II is the occurrence of copper arrowheads in burials. These are typologically very similar to those illustrated from Mature Harappan contexts (V. N. Misra 1970a:225).

The two relevant radiocarbon determinations for Bagor (table 5) at this point are TF-1009, 3395–3160 B.C. for the Period I/II transition, and TF-1005/1006, 2645–2310 B.C. for Period II proper (table 5). They support the notion that Bagor had substantial contacts with the Harappan Civilization as well as with the Ahar and Kayatha Complexes (see below).

Ganeshwar/Jodhpura

Ancient copper tools have been discovered in abundance in Rajasthan and adjacent areas (see fig. 9 and Agrawala 1978, 1979, 1980; Agrawala and Kumar 1982). Excavations at the site of Ganeshwar in Sikar District produced over a thousand copper implements including arrowheads, spearheads, bangles, celts, chisels, fishhooks, and the like (Agrawala and Kumar 1982: pls. 11–1 through 11–7). These tools were found in association with a "microlithic" stone tool kit and incised ceramics. Typologically the metal tools are definitely Harappan, although the Ganeshwar specimens may have somewhat greater stylistic variation than the Harappan inventory usually admits. Celts like those found at Ganeshwar, while they are of Harappan type, have also been found at places like Ahar (Sankalia, Deo, and Ansari 1969: 199–203, pl. 22 and fig. 122), Kayatha (Ansari and Dhavalikar 1975: pl. 25), and Navdatoli (Wheeler 1959: pl. 25), possibly expanding the arc of interaction between sites in Rajasthan and those to the southeast.

Agrawala and Kumar (1982) refer to the ceramics from Ganeshwar, and a second site known as Jodhpura, as OCP or Ochre-Colored Pottery. This has a close typological affinity with the incised wares from Ahar and Bagor. The OCP presents us with a complex, imperfectly understood problem. The pottery from places like Ganeshwar, Jodhpura, Bagor, and the Ahar and Kayatha Complexes all overlap in their typology, principally in the red-to-buff incised wares (for Ganeshwar compare Agrawala and Kumar 1982: pl. 11.8 with citations given above for the Bagor ceramics). There are two radiocarbon determinations from Jodhpura (table 5) that are associated with the incised ware in question. They calibrate to PRL-277, 850–755 B.C., and PRL-278, 2895–2515 B.C. The lack of agreement between the two determinations does not provide us with information that will independently date Jodhpura and, by inference, Ganeshwar. The typological ties to the incised wares from other sites already noted, especially Bagor II, suggest that these places, and others like them in northern Rajasthan, belong to the first half of the third millennium B.C.

No fewer than eight other sites, unfortunately more poorly known than Ganeshwar, have also produced copper tools of the distinctive types mentioned above. Some of these tools have inscriptions in Indus script. The sites are listed in Agrawala and Kumar (1982:130–31) and appear on our figure 9.

All of these sites, as well as those of the Ahar Complex, are near the well-known Khetri Copper Belt (Agrawal 1971:147–48). For example, Ganeshwar is near old copper mining activity at Dariba, Ahuirwala, and Baleshwar (Agrawala 1978). Copper mines at Matoon and Umara are only ca. 20 km from Ahar (Agrawala and Kumar 1982:131). It is therefore perfectly reasonable to presume that the Khetri Belt was *one* of the sources of Harappan copper. Moreover, it was people who once inhabited places like Ganeshwar, Jodhpura, Bagor, Pugal, and possibly Ahar who were most probably active participants in the production and distribution of this metal.

The significance of this reconstruction for the chronology of prehistoric India lies in the fact that the dates at hand are not inconsistent or incorrect, nor are we dealing with "mesolithic survivors" at places like Bagor and Ganeshwar. Rather we are confronted with sophisticated populations at these sites, and others like them. They may have lived in small groups, possibly organized on

"band" or simple lineage principals, but they seem to have played an important role in a regional economy. This ultimately involved the integration of peoples including hunter-gatherer-herders, settled farming peoples like those of Ahar and Kayatha, and possibly even the urbanized elite of the Indus Civilization.

Lothal and Langhnaj

Additional evidence for this kind of economic relationship among the peoples of western India during the second and third millennia B.C. is available from the sites of Lothal (S. R. Rao 1973, 1979) and Langhnaj (fig. 3; Sankalia 1965). This has been discussed in two places (Possehl 1976, 1980:67–80) and therefore need not be reviewed in detail here. Lothal's position on the southeastern border of the Mature Harappan Civilization suggests that its inhabitants were involved in the maintenance of relations with other kinds of people across the "border." Economics would certainly have been an area of strong interest given the craft and commercial character noted at Lothal.

Langhnaj is a site with an abundant microlithic industry. Located some 100 km north of Ahmedabad in Gujarat state, it has a radiocarbon determination number TF-744, calibrated to 2440–2160 B.C. (table 5). There are also three thermoluminescence dates from the dunes at Langhnaj (Singhvi, Sharma, and Agrawal 1982); however, the report on them deals with TL technique aimed at dating geological formations, not habitation sequences. Associated with the radiocarbon determination is a copper knife of high purity, Black and Red Ware pottery, and beads of Harappan type. H. D. Sankalia has recently taken issue with these two pieces of evidence, but in his report on the Langhnaj excavations he notes that stone disc beads were found at the excavation (Sankalia 1965:41). Such stone disk beads are perfectly legitimate Harappan types. Moreover he makes special note of the presence of Black and Red Ware sherds from "fairly low levels" (1965:44). This is at odds with his more recent statement (Sankalia 1982:4).

Possehl (1980:67–80) offers the reconstruction of Langhnaj's place in the second millennium regional economy of western India. This paper suggests that Langhnaj and other sites like it were inhabited by peoples who were involved in some kind of economic exchange with the Harappans at settlements like Lothal. The Langhnaj subsistence regime seems to have been based on hunting and gathering since no domesticated species were found there. The mobility of peoples of this type would have brought them into regular contact with the kinds of raw materials that the craftsmen of Lothal needed to keep their "factories" busy. These materials would have been exchanged for Harappan products like the copper knife and disk beads recovered from Langhnaj. This remains a viable hypothesis. The evidence from Bagor and Ganeshwar tends to make this proposition even more tenable.

Additional evidence, and interesting chronological information, comes from the dune site of Kanewal located about 165 km south of Langhnaj, in Kheda District, at the head of the Gulf of Cambay (Mehta, Momin, and Shah 1980). Kanewal has an occupation level with a transitory settlement following one of the phases of the Gujarati Post-urban Harappan within which Lustrous Red Ware was used. The transitory settlement has a proper microlithic tool kit and no formal architecture.

Settlement surveys in Gujarat, summarized in Possehl (1980), have demonstrated a strong line of continuity for the Post-urban Phase Harappans there. The stratigraphic sequence at Kanewal offers reasonably conclusive evidence for the geographic and chronological overlap of the Post-urban Harappan with hunter-gatherer-(herders?) in this region.

Some Inferences from Biological Anthropology

A recent paper by Kennedy, Chimet, Disotell, and Meyers (1984) shows in a broadly suggestive way some major lines of "cleavage" among various early South Asian populations. Three population clusters emerged from their multivariate analysis: (1) a group of hunter-gatherers that includes Langhnaj, Sarai Nahar Rai, and Mahadaha among other sites; (2) a western population dominated by Harappans, but including the later inhabitants of Timargarha (Dani 1967), but excluding Lothal; and finally (3) the ancient populations found at Lothal and Langhnaj.

The suggestion that the Lothal population shared many biological features with that of Langhnaj has been made before (Possehl and Kennedy 1979). This analysis by Kennedy and his colleagues is the most rigorous support for this proposition. We infer from this juxtaposition of features that the inhabitants of Langhnaj, Lothal, and doubtless other sites in their region were sharing their people as well as goods.

Although this model of the Interactive, Trade and Barter aspect of the Indian Microlithic Technological Tradition was not originally derived from a study of the ethnographic record in India, it shares much with this scene (Roy 1912; Gardner 1965, 1972; Fox 1969; and Sinha 1972). Hunter-gatherer agriculturalist exchange is an extremely important cultural and social relationship with considerable value for explaining the past (Possehl and Kennedy 1979; Peterson 1978:346–48).

The Development of the Sedentary Village in India

The Indus Valley

Jim Shaffer's contribution to this volume outlines the development of village farming communities in the Greater Indus Valley. Recent excavations at Mehrgarh have documented these beginnings as within the seventh millennium (Jarrige 1979, 1981, 1982, 1984a, 1984b, 1986; Jarrige and Lechevallier 1979). The Mehrgarh sequence serves to confirm the work done by Walter Fairservis in Quetta (1956). A strong thread of continuity allows us to trace the path of cultural change and development from these foundations to the emergence of Indus urbanization at ca. 2500 B.C. based on calibrated dates. A transitional period of perhaps 150 years has been proposed by Possehl (1986:93–99) as a critical time of rapid change which immediately preceded the emergence of the Urban form of the Harappan tradition at ca. 2500 B.C. It is within this short period of time that many, but not all, of the distinctively Harappan, urban features of this early civilization seem to have been fashioned. This transitional period is documented within the two building phases of Amri II (Casal 1964:39–42).

This short period of rapid cultural change preceding the emergence of the Urban Phase of the Harappan Civilization rests on some four thousand years of cultural development in the region. Our proposal does not conform to the once popular view that the roots of the Indus Civilization were shallow, that the Indus Valley had somehow lagged behind Mesopotamia and Egypt (e.g., Piggott 1950). On the contrary, the roots of the Indus Civilization are deep, but the pace of cultural change was varied, in the Indus Valley as elsewhere.

To the east of the Greater Indus Valley, village farming communities first appear in the very early third millennium and seem to have emerged within a series of complex and poorly understood cultural environments in Gujarat (Somnath), Mewar (Ahar), Kashmir (Gufkral), and the central and southern Indian hills and plains. Peoples, such as those at Bagor and Adamgarh, whose subsistence adaptation drew on both wild and domesticated resources, were very much a part of this sociocultural context.

In some respects much of this early village-farming-community material is well studied. Since the material inventory is known, and since there has been a fair amount of survey, something can be said of settlement patterns. In some instances the ceramics are sufficiently well studied so that an exercise in ceramic "philately" is no longer necessary. To lend order to this discussion we have chosen, more or less arbitrarily, to move from north to south, pausing to discuss the Kashmir Neolithic, the village farming communities in eastern India, the Banas "culture" and Kayatha, as well as settled farming communities in central and southern India.

The Kashmir Neolithic

The Archaeological Survey of India has conducted major excavations at two early food-producing sites in the Vale of Kashmir: Burzahom and Gufkral (table 6). Burzahom lies 25 km northeast of Srinagar and was originally reported by H. DeTerra and T. T. Patterson (1939:233–34). The survey's excavation team, headed by T. N. Khazanchi, began work in 1960. The best reports have appeared in *Indian Archaeology: A Review* (1960–61b:11, 1961–62a:17–21) and authored by Pande (1970, 1973).

Burzahom

Of the three periods at Burzahom—Neolithic, Megalithic, and Historic (fig. 3)—only the Neolithic material is of immediate concern. There are two architectural levels to the Neolithic period, here designated Phases IA and IB. The earliest settlers cut pit dwellings into the loess on which the site is built. These are replaced by mud-brick buildings and others that are built of stone rubble in Phase IB.

The ceramics are handmade coiled pots which are generally gray, brown, even black in tone. They are frequently burnished and sometimes incised (*Indian Archaeology: A Review* 1961–62a: figs. 5, 6, and 7). Mat impressions often appear on the bottoms of the pots.

The bone tool industry is unusually rich, especially for a South Asian site. Bone awls, needles, spatulas, and elaborate harpoons are present along with other implements (*Indian Archaeology: A Review* 1961–62a: fig. 8).

Ground stone implements include adzes, axes, and chisels along with flat rings on a fine-grained stone. Of unusual interest are flat, rectangular knives with two holes near the center of the top, apparently used in hafting. In another geographic context these might be called *ulus* (*Indian Archaeology: A Review* 1960–61a: pl. XVIII).

Reasonably unambiguous animal burials include the remains of dogs, wolves, the barasingha (a local ungulate), and the Himalayan ibex. There is one very fine dog burial in Phase IB (Agrawal 1982a:105).

Of particular interest at Burzahom is a pot from Period IB with classic Kot Dijian features on which is painted one of the "horned dieties" as seen at Kot Diji (Khan 1964: fig. 16) and Gumla (Dani 1970–71: fig. 1a). The Burzahom pot has been published in several places (including Agrawal 1982a:102; Sankalia 1974:353). When excavated it contained over nine hundred beads of carnelian and banded agate (B. M. Pande, pers. comm.).

This pot is important when considering the economic relationships between the plains of India and Pakistan and the mountains to their north. There is a long list of products found at Pre-urban and Urban Phase Harappan sites on these plains, which are likely to have come from the Himalayas (see Fentress 1976:306–9 for a tabulation of these and other products).

We do not believe that this pot has great chronological significance, for similar vessels and fabrics have recently been found side by side with Mature Harappan materials at Manda (J. P. Joshi and Madhu Bala 1982:187) and Ropar, incorrectly "Rupar" (Y. D. Sharma 1982:161). It is becoming increasingly clear that the diagnostic materials that define M. Rafique Mughal's (1970) "Early Harappan" occur in contexts contemporary with the Mature, Urban Harappan, at least in the eastern "domain" of the civilization (Possehl 1982b: fig. 3).

Gufkral

The chronology of Burzahom is now interwoven with that of another site known as Gufkral (fig. 3), also located in Kashmir, ca. 42 km southeast of Srinagar. A. K. Sharma's (1982:19) excavations there revealed the following cultural sequence:

Period III	Historic
Period II	Megalithic
Period IC	Late Neolithic
Period IB	Early Neolithic
Period IA	Aceramic Neolithic

In the Aceramic Neolithic, Sharma found that the inhabitants of Gufkral had dug pit houses into the loess, just as in Period I at Burzahom. In addition the ground stone inventory of this occupation shares some features with Burzahom in that there are ground stone celts and an unfinished ring stone. Querns are also present, along with a rich bone tool inventory (A. K. Sharma 1982:21 and pls. II and III).

The animal remains from Aceramic Gufkral include both wild and domesticated sheep and goats. In addition, the inhabitants hunted cattle, red deer, the Himalayan ibex, and other local species (A. K. Sharma 1982:21).

Although the plant remains of Period IA have not yet been systematically reported, A. K. Sharma has noted the presence of both wheat and six-row barley, along with a lentil (1982:22).

Period IA at Gufkral seems to represent a settlement earlier than the initial period at Burzahom. The two sites are, however, a part of the same cultural tradition. This becomes even clearer in Gufkral IB with the introduction of ceramics like those of Burzahom IA (A. K. Sharma 1982: pl. II).

Animal remains from Gufkral IB indicate that the inhabitants were still predominantly hunters. The domesticated goats, however, show a reduction in size and a short-horned *Bos* makes an appearance. A domestic fowl (*Gallus sp.*) is also present. The common pea (*Pisum arvense*) was added to the inventory of cultivars (A. K. Sharma 1982:32).

In the final Neolithic settlement of Period IC at Gufkral, hunting was very much reduced as a subsistence activity. The sheep, goats, and cattle are all said to be domesticated, and pigs were added to the resource base (A. K. Sharma 1982:23). All food grains found in IB were also present in Period IC.

Based on a comparison of the ceramics, and the fact that Gufkral IA seems to be aceramic, we propose a rough equivalence between Gufkral IB and the initial Burzahom settlement. Gufkral IC then equates to Burzahom IB. This relationship is not clarified by a consideration of the radiocarbon determinations given in table 6.

Dates and periods for Gufkral are in A. K. Sharma (1982:24–25). The chronology of Burzahom given here is after D. P. Agrawal and Sheela Kusumgar (1974:68). We have not found it possible to assign specific periods to all of the dates from Burzahom; therefore the material in table 6 is somewhat selective.

For the initial "Aceramic" phase of the Kashmir Neolithic we must disregard BS-358 and assume on stratigraphic grounds that Period IA at Gufkral predates BS-359, 2660–2385 B.C. On this basis we estimate the date for the Aceramic phase at ca. 2800–2500 B.C. Phase IB at Gufkral and Phase IA at Burzahom can then be placed at approximately 2500–2000 B.C. The final occupation of the Kashmir Neolithic, Gufkral IC, and Burzahom IB can then be estimated at ca. 2000–1500 B.C. It may be that the end date of 1500 B.C. will be extended by additional research. These dates are, of course, very tentative, and we suggest that the breaks between "periods" occur at approximately 500-year intervals to emphasize this fact.

Material very similar to the Gufkral/Burzahom collections is available from Ghaligai Cave Period III (Stacul 1967; Shaffer, this vol., chap. 26) and Loebanr III (Stacul 1977; Shaffer, chap. 26), both in Swat, Pakistan. The chronology suggested above does not conflict with the estimated dates for these two sites (Shaffer, chap. 26).

Further typological parallels appear in the Neolithic levels of Sarai Khola, near Taxila in northwestern Pakistan (Halim 1972). M. Rafique Mughal's analysis of the Sarai Khola ceramics contains a discussion of these ties and of parallels with the Neolithic of north China (Mughal 1972:36).

There are also general typological similarities between the Kashmir Neolithic and materials from southern Siberia, in the vicinity of Lake Baikal. These have been summarized in English by Henry N. Michael (1958).

The chronology for these far-flung materials does not

rule out the possibility that the mountains and plains of the subcontinent represent the southwestern edge of what would otherwise be a northeastern Asian cultural tradition. There are, however, immense unsolved problems associated with such a proposition, for the typological parallels are far from being well established. Moreover, we are still in search of a model to explain the broad geographical expanse of the north Asian cultural configuration, if in fact the typological studies provide us with sufficiently compelling evidence for true historical connections.

Settled Communities in the Eastern Ganges

The chronology of the early village farming communities in the Indian states of Punjab, Haryana, northern Rajasthan, and western Uttar Pradesh has been covered by Jim Shaffer in this volume and elsewhere (Shaffer 1981). Farther afield, settled farming communities on the eastern Gangetic plain in eastern Uttar Pradesh, Bihar, and Bengal have not received much attention from the archaeologist. We have already discussed the materials from the Belan Valley. There are, however, additional sites.

Sohgaura

Excavations at Sohgaura in Gorakhpur District of far northeastern Uttar Pradesh have yielded two radiocarbon determinations for a Chalcolithic period. These are given in table 7.

Soghaura seems to fit with an emerging body of material from Bihar and West Bengal, documenting the establishment of settled farming communities (Arara, Bahiri, Barudih, Bharatpur, Mahisdal, and Chirand) in this region during the middle of the second millennium B.C. The radiocarbon determinations for these sites are also given in table 7.

Arara and Bahiri

These two sites (fig. 7), recently worked on by Dilip Chakrabarti, seem to represent late prehistoric settlement in West Bengal. The Black and Red Ware of Arara may relate to ceramics at other Neolithic/Chalcolithic settlements such as Bharatpur, Mahisdal, and Chirand.

Chirand

The most significant Neolithic/Chalcolithic site in Bihar is the mound of Chirand near the confluence of the Ghagra and Ganges rivers (fig. 7; Narain 1970; Verma 1970–71; Sankalia 1974:304–5; *Indian Archaeology: A Review* 1981–82:27–30). The site has three main periods: III, Iron Age; II, Chalcolithic; and IA/B, Neolithic.

During the whole of the Chirand Neolithic the inhabitants lived in small dwellings. In Phase IA there is some suggestion of round houses, possibly small pit-houses with bamboo screens around them. In IB there is a mud-brick wall.

The worked stone inventory includes polished celts and microliths. The ceramics include a Gray Ware with both burnished and unburnished surfaces, and a Black and Red Ware. There is also a rich bone industry, ground stone querns, balls, and pestles.

Verma (1970–71:22) cites evidence for the cultivation of wheat, barley, rice, *masoor* (*Lens esculenta*), and *moong* (*Phaseolus aureus*), all from the Neolithic levels. The evidence for rice comes in the form of husks in pieces of burnt clay, as well as charred grains. These reports are, however, not yet fully satisfactory.

Radiocarbon determinations indicate that Chirand I may date to the beginning of the second millennium (ca. 2200–1500 B.C.). It should be noted that TF-445, 1990–1695 B.C., came from a pit filled with microliths and sealed by the Neolithic IA deposit (Agrawal and Kusumgar 1969:189). Sankalia has observed that there may be earlier important material at the site (1974:304).

Chirand II may date to something on the order of 1500–800 B.C. Agrawal (1982a:245) has noted the presence of iron in period IIB.

Bharatpur

At this site in Burdwan District, West Bengal, the Archaeological Survey of India conducted excavations during the field seasons of 1971–72, 1972–73, and 1973–74. Short reports can be found in *Indian Archaeology: A Review* for these years. In Period I (the rest of the site is Iron Age and later), the following is reported:

> Ceramic industries, associated with the earliest culture includes the characteristic painted and plain black-and-red ware and buff-on-red wares. The shapes represented in the different wares were found to be similar to those from the earliest deposits of Mahisdal and Pandu Rajar Dhibi. The design repertoire was essentially linear, such as wavy lines in groups, vertical and horizontal bands and oblique strokes. Among other finds mention may be made of: objects of bone and antler; neolithic celts; microliths; and beads of semiprecious stones. The use of copper was scarce. (*Indian Archaeology: A Review* 1972–73:36)

Mahisdal and Pandu Rajar Dhibi

Two more early farming communities in the eastern Ganges Valley are Mahisdal (*Indian Archaeology: A Review* 1963–64c: 59–60; B. Allchin and R. Allchin 1968:198–99) and Pandu Rajar Dhibi (Dasgupta 1964; *Indian Archaeology: A Review* 1961–62c:59–62, 1962–63b:43–46, 1963–64d:61–62, 1964–65b:46–48).

Mahisdal is located in Birbhum District (fig. 7). Period I has small, simple huts of plastered reeds. Pottery includes a white-painted black and red ware, as well as an unpainted variety, and a red ware, sometimes with black paint. As noted above, the forms complement those of Pandu Rajar Dhibi, especially the spouted bowls. A stone blade industry is associated with at least one copper celt. A mass of charred rice was also found in Period I.

Pandu Rajar Dhibi is in adjacent Burdwan District of West Bengal (fig. 7) with ceramics much like those of Mahisdal. A radiocarbon date of 1012 ± 120 b.c. that has no apparent laboratory designation was run by neither the Tata Institute nor the Physical Research Laboratory (D. P. Agrawal, pers. comm.).

Given the radiocarbon dates, it is possible to date these early villages of the Mahisdal/Pandu Rajar Dhibi type to approximately 1500–600 B.C.

Barudih

This is an early village farming community in Singhbhum District of Bihar. Not much is known of the site (*Indian Archaeology: A Review* 1963–64a:9), but the dates given above place it within the same chronological horizon as Chirand, Bharatpur, Mahisdal, and Pandu Rajar Dhibi.

Sonpur

The K. P. Jayaswal Research Institute, Patna, carried out excavations at the mound of Sonpur in Gaya District of Bihar for at least five seasons, most of them during the 1960s. It is clear that there is early material there, comparable to that from the places just discussed, but there has not yet been a sufficiently clear exposition of it to make a chronological judgment (see *Indian Archaeology: A Review* 1961–62d:4–5, 1970–71:5–6).

Early Village Farming Communities in Mewar and Malwa

In the western regions to the south of the Ganges Valley, village farming communities emerge as a broad horizon within the first half of the third millennium B.C. Two considerations should be kept in mind: (1) the settled farming community is only one of the major forms of adaptation that food producers in India made at this time; and (2) the emergence of settled communities along the eastern borders of the Greater Indus Valley just when the Urban Phase of the Indus Civilization takes form is not necessarily unrelated.

The Banas and Kayatha Complexes

In southwestern Rajasthan, in the vicinity of the Banas River and its tributaries, a region known as Mewar, the initial phase of agricultural settlement develops in the middle of the third millennium. Banas material has been substantially brought to light at Ahar (figs. 10 and 11), near the modern city of Udaipur (Sankalia, Deo, and Ansari 1969). There is also an important survey report on an exploration of the Banas and Berach valleys (Misra 1967).

Ahar

Although Period I at Ahar has been divided into three subperiods—a, b, and c—there is a basic continuity of material throughout. A distinctive Black and Red Ware with white paint occurs in all three subperiods. Found elsewhere, it is a useful chronological aid. Ahar I is notable for the virtual absence of stone tools. The needs of the inhabitants in this regard were apparently met by copper implements, which are abundant. Copper mines in the vicinity of Ahar were mentioned above.

Radiocarbon determinations for Ahar I are given in table 8. Date TF-37 should probably be disregarded in this series because of its inconsistency with the others. A chronology for Ahar I is reasonably reconstructed as follows: Period Ia, 2600–2150 B.C.; Period Ib, 2150–1950 B.C.; and Period Ic, 1950–1500 B.C. or later.

Kayatha

Kayatha lies ca. 285 km southeast of Ahar on the Malwa Plateau (figs. 10 and 11), a fertile area drained by the River Chambal and its tributaries. Two separate excavations have taken place there: the first by V. S. Wakankar (1967), the second by a Deccan College team (Ansari and Dhavalikar 1975). The long series of radiocarbon determinations from this site are difficult to organize by period due to inconsistency in reporting. There has been some selection of dates in table 9.

Three periods at Kayatha are of concern here. Period I has a unique ceramic assemblage (Ansari and Dhavalikar 1975:4) with "Kayatha Ware" which has designs in purple painted over a deep brown slip. There is also a Buff Ware with painting in red as well as a Red Incised Ware.

Kayatha was apparently abandoned between Periods I and II. Period II ceramics show strong parallels with Ahar Ib and Ic. These are so close that the excavators have suggested that the site may have been settled by peoples from Rajasthan during this time (Ansari and Dhavalikar 1975:6). The predominant evidence appears to be the presence of the distinctive Ahar white-painted Black and Red Ware. But Ahar-style Red Slipped Wares also occur in quantity and with some variations in tan, orange, chocolate, and brown, all burnished in Aharian fashion. Only a few sherds of the purple-painted Kayatha Ware occur in Period II (Ansari and Dhavalikar 1975:6). There are

seven dates for Kayatha II, including one for the Period I/II transition given in table 9.

Period III at Kayatha is marked by the introduction of Malwa Wares. This is a well-known ceramic corpus known from Navdatoli, Apegaon, Songaon, Inamgaon, and a host of other sites in central India. The pottery of Kayatha III is generally orange to buff in fabric and painted black, at times deep purple, but different from the Kayatha Ware. Most of it is wheel-thrown. The Ahar Black and Red Ware continues on from Period II. We note here that this ware occurs only in the earliest phase of occupation at Navdatoli. Dates for Kayatha III are also found in table 9.

We propose the following summary chronology for Kayatha:

Period III	Malwa period	1700–1400 B.C.
Period II	Banas period	1950–1700 B.C.
Period I	Kayatha period	2450–2000 B.C.

The Foundations of the Central Indian Chalcolithic

We have already noted the presence of Malwa ceramics in Period III at Kayatha. This complex is extremely important and widespread throughout the states of Madhya Pradesh and Maharashtra in the second millennium B.C. It is earlier than the so-called Jorwe culture throughout large parts of this same region. Together the Malwa and Jorwe materials are known as the Central Indian Chalcolithic. In recent years archaeologists have found materials preceding the Central Indian Chalcolithic at sites such as Songaon, Bahal, and Daimabad.

Songaon

At Songaon (figs. 10 and 11; Deo and Majumdar 1969, incorrectly "Sonegaon") a stratum resting on virgin soil was associated with a distinctive Blotchy Gray Ware in the following stratigraphic series (Deo and Majumdar 1969:5):

Period III	Late Jorwe Ware, Black and Red Ware, Red Ware
Period IIb	More Jorwe Ware than Malwa Ware
Period IIa	More Malwa Ware than Jorwe Ware
Period I	Blotchy Gray Ware and Coarse Red Ware

The one radiocarbon determination for Period I is as follows: TF-384, 1890–1655 B.C. (table 10).

Two points concerning this ceramic inventory are that (1) S. B. Deo, who worked at Ahar with the Deccan College team, notes that the Black and Red Ware of Period III is different from that of Ahar I (Deo and Majumdar 1969:5); (2) the Blotchy Gray Ware shares typological similarities with the Gray Ware of the so-called southern Neolithic (see below). The radiocarbon determination for Period I, TF-384, calibrated to 1890–1655 B.C., is perfectly in keeping with this association (see Deo and Majumdar 1969:6 for a correction to Agrawal and Kusumgar 1968:139, where TF-384 is associated with Period II).

Bahal

There are no radiocarbon dates for Bahal (fig. 10). The Blotchy Gray Ware occurs there, and it is presumably the chronological equivalent of Songaon I.

Apegaon

At Apegaon, Deo, Dhavalikar, and Ansari (1979) did not find a Gray Ware in pre-Malwa context, however a distinctive ceramic christened "Ramatirtha Ware" occurred (fig. 10). This is a typological equivalent to the Savalda Ware found in the Tapti Valley (Sali 1970). Radiocarbon dates are presented in table 10.

Daimabad Period I

At Daimabad in Ahmednagar District of central Maharashtra (fig. 10), S. A. Sali of the Archaeological Survey of India has uncovered a five-period sequence of prehistoric occupation (Sali 1986, 1982:177; see table 10 for radiocarbon dates).

Period V	Jorwe Complex	1500–1100 B.C.
Period IV	Malwa Complex	1700–1500 B.C.
Period III	Buff and Cream Ware Occupation	1800–1700 B.C.
Period II	"Late Harappan" (equivalent to Post-urban Phase Rangpur IIB/C?)	1900–1800 B.C.
Period I	Savalda Occupation	2000–1900 B.C.

In addition to the Savalda Ware, which equates with Ramatirtha Ware of Apegaon I, there is a Period I Blotchy Gray Ware at Daimabad (M. K. Dhavalikar, pers. comm.). This ceramic has not been sufficiently well studied to propose equivalences with other wares in Maharashtra and Madhya Pradesh, however it does resemble the Gray Wares of the Southern Neolithic of peninsular India (B. Allchin and F. R. Allchin 1968:168).

The Post-urban Harappan material of Daimabad II is quite convincing. Sturdy redware fabrics like those from Rangpur IIB or IIC are present. The inhabitants of Daimabad II also used mud-bricks for house construction. An extended supine burial in a brick-lined grave, a terracotta "seal" with a well-formed Harappan "letter," and a potsherd with an Indus inscription all make the case (Sali 1982: pls. 15.1–15.6). The Buff and Cream Ware occupation is not well understood at this time.

In reviewing the Daimabad dates in table 10 we find a convincing match in the C-14 chronology between Daimabad I, Apegaon I, and Songaon I, suggesting a date of

2000–1900 B.C. for this material. The Buff and Cream Ware levels at Daimabad III have been given a date of ca. 1900–1800 B.C., which is not out of line with PRL-655.

The date of 2195–1750 B.C. (PRL-426) for Daimabad II is in keeping with what is known of the Harappan chronology in neighboring Gujarat (see below). The second date is several hundred years younger than would be expected, especially given the absence of Lustrous Red Ware at Daimabad.

Recent work in the Tapti Valley, one of the traditional passes through the Western Ghats between the lowlands of Gujarat and the uplands of the Deccan plateau, has shown that there are a number of sites with Post-urban Phase Harappan materials. (Dhavalikar, pers. comm.). Deccan College excavated one of the sites during the 1984–85 field season. Sali's earlier work there (1970) also demonstrates the presence of his Savalda Complex, along with Post-urban Phase Harappans.

The Harappans in Gujarat

An Overview of the Chronology

A chronology for the Harappans is available in several places (Agrawal 1964, 1965, 1966, 1982a; Fairservis 1975; Possehl 1980; Shaffer, this vol., chap. 26).

Large-scale excavations at Mature Harappan sites in Gujarat have been conducted at Lothal (Rao 1973, 1979, 1985), Rangpur (Rao 1963), and Surkotada (Joshi 1972). Smaller excavations were undertaken at Desalpur (Soundara Rajan 1984) and Pabumath by the Gujarat State Department of Archaeology (*Indian Archaeology: A Review* 1977–78:21, 1978–79:67–68, and 1980–81:14). These are all sites with the "classic" inventory of Urban Phase Harappan materials: inscribed seals, as well as distinctive Harappan ceramics, metalwork, beads, architecture, and the like. Radiocarbon determinations from Lothal and especially Surkotada (table 11) can be used to suggest that the Urban Phase Harappans settled Gujarat, including Kutch, in ca. 2400–2300 B.C.

In 1980, Possehl presented maps showing the distribution of sites from three phases of the Gujarati Harappan (1980:57–59), ranging from the Urban Phase (Rangpur IIA) through the Lustrous Red Ware Period (Rangpur III). These maps showed an Urban Phase penetration of Gujarat through Kutch, proceeding on to Rangpur, Koth, and Lothal. These latter sites were then thought to be on the southeastern border of the Urban Phase Indus "state." In the succeeding Rangpur II B–C phase there appeared to have been a very significant increase in the number of sites in this region, especially Saurashtra (also noted in B. Allchin and R. Allchin 1968:182–83). This was thought to have been related to the introduction of *bajra* (*Pennisetum typhoideum*), *jowar* (*Sorghum bicolor*), and *ragi* (*Eleusine coracana* and *E. indica*) into the Indian subsistence economy (Possehl 1980:8–9).

The Lustrous Red Ware Period (Rangpur III) was well represented in Saurashtra, although there appeared to have been a drop in the number of settlements from the time of Rangpur II B–C. Lustrous Red Ware had been found in the highlands surrounding Gujarat, at Ahar, Navdatoli and Chandoli, and it was from these places, and Lothal B, that a tentative chronology for the Harappan Tradition in Gujarat had to be fashioned (Possehl 1980:40–44). In 1980 there were very few radiocarbon determinations for the Rangpur II B–C and III periods. It is somewhat surprising to see how little has changed in this regard.

The ceramics of Lothal B and Rangpur II B–C have generally been seen as comparable and representative of the initial Post-urban Phase in Saurashtra. Possehl has listed 120 sites (1980:60) with what he considered Rangpur II B–C ceramics, and more have been discovered since then as reported in the yearly installments of *Indian Archaeology: A Review.*

The reinvestigation of Rojdi, a Harappan site in Rajkot District, has somewhat altered the chronology of the Harappans in Gujarat. The pottery from Rojdi is clearly of the Harappan tradition, but it lacks the key Urban Phase ceramic markers: the classic goblet, beaker, S-form jar (with the possible exception of one rather atypical example in *Indian Archaeology: A Review* 1958–59:20, fig. 9, B, 2), and the teacup with a perforated handle. Rojdi has not yielded a single sherd with the Indus black-on-red painting style. The site has also failed to produce any of the Harappan stamp seals or the other Urban Phase Harappan paraphernalia of daily life as found at Mohenjodaro, Chanhudaro, or the other sites against which one might measure such cultural dimensions. With the exception of one or two possible examples, Rojdi is also devoid of Lustrous Red Ware.

The New Chronology for the Harappans in Gujarat

The material inventory of Rojdi initially suggested that the history of the site was to be found within the Post-urban Phase, with a possibility that the settlement was founded in the later part of the Harappan Urban Phase. However, new radiocarbon dates (table 11) place most of the occupation within the time period of the Urban Phase Harappan.

Frank Herman, the person charged with the primary analysis of the Rojdi pottery, has examined a portion of the full ceramic corpus. His work suggests, at least in a provisional way, three ceramic phases at the site (Rojdi A, B, and C). The earliest Rojdi A is quite similar to the

Urban Phase pottery of Rangpur IIA, but the distinctive Indus painting style is absent and some of the key vessel forms of the Urban Phase Harappan are variants of what we know of from places like Mohenjodaro, Chanhudaro, or even Surkotada (e.g., the goblet and S-profile jar). Rojdi C, the upper levels of the site, has pottery that is characteristic of the early Post-urban. Rojdi B is late Urban Phase, possibly transitional to the Post-urban.

The new radiocarbon dates from Rojdi A and B (table 11) seem to compare well with those from Lothal A and the three phases of occupation at Surkotada (table 11) and are fully congruent with the chronological data for the date of the Urban Phase in Sind and Punjab (Shaffer, this vol., chap. 26), even recognizing the fact that there seems to be a complex cultural mosaic of cultures in the vicinity of 2600 to 2400 B.C. in the southern Indus Valley.

While the bulk of the occupation at Rojdi falls within the Urban Phase, the material inventory of Rojdi A and B is clearly not of the Mature Harappan, at least as we know it from Mohenjodaro, Chanhudaro, and other sites in Sind, or even Lothal and Surkotada, within Rojdi's region. This material inventory is also shared between Rojdi and a very large number of settlements in Saurashtra. Many, if not most, of the 120 sites associated with Rangpur II B–C listed in Possehl (1980:89–119) would fall into this category, for example.

Rojdi A and B, and many other sites in Saurashtra, and possibly north Gujarat as well, appear to represent a new regional expression of the Harappan Urban Phase. We propose to call this new regional *Urban Phase* manifestation the "Sorath Harappan," drawing on one of the ancient names for Saurashtra. The Post-urban Phase in Gujarat might then be called the "Sorath Post-urban Harappan." The Sorath Harappan of Urban Phase times is stylistically divergent from the Harappan Tradition as it is known from the Urban Phase sites in Kutch and Sind/Punjab; but it is clearly a part of this larger cultural whole. If judged from the most preliminary evaluation of the Sorath Harappan it also appears to be less internally differentiated than what we know of the Urban Phase Harappan elsewhere.

The Sorath Harappan

Sites of the Sorath Harappan are generally quite small. In fact, Rojdi at ca. 7 ha is the largest settlement that is known, if one rules out places with obvious signs of lateral stratigraphy. The average site size can be estimated at 5.3 ha (Possehl 1980:65), suggesting little range in settlement dimensions as well. Second, the material inventory of the sites is simple, if compared to sites in other Urban Phase regions. There are no stamp seals and very little writing (one sherd from Rojdi has an inscription). Ornaments are not abundant; architecture is not elaborate, although there are foundations at the site of Somnath that may be those of a public building. There are circumvallations around some settlements, including Rojdi. Human remains from the entire range of Indus sites in Gujarat are rare, giving us little by way of an insight into the Sorath Harappan from this important data set. The ceramics for the Sorath Harappan present us with a challenge, one that will eventually lead to a far more crisp definition of this assemblage than is available today.

The discovery of the Sorath Harappan gives us a potential insight into another of the problems faced within the Saurashtran Chalcolithic sequence. This came from the site of Somnath, at Prabhas Pathan on the south coast of the peninsula.

The Mound of Somnath at Prabhas Pathan

In the early and mid-1970s, Deccan College and the Gujarat State Department of Archaeology began the reinvestigation of the site of Somnath (*Indian Archaeology: A Review* 1971–72, 1975–76b, 1976–77b; Sankalia 1972). This site had been excavated at an earlier date, for which there is a modest final report (Nanavati, Mehta, and Chowdhary 1971). In the course of the renewed excavation, eight radiocarbon determinations were secured. These are given in table 11.

The Period I, Pre-Prabhas dates are the earliest for a fully food-producing economy in Gujarat. In fact, excepting the dates from Bagor in Rajasthan (V. N. Misra 1973a) and Adamgarh Cave in central India (R. V. Joshi 1978), sites with a herding component integrated into an otherwise hunting and gathering subsistence economy, the Somnath dates are the earliest for a food-producing economy within the bounds of the present Indian nation. They certainly antedate the Banas culture of southern Rajasthan, along with the Kayatha, Malwa, and Jorwe complexes of central India and their suggested predecessors (Dhavalikar 1970). In fact, to the excavators they seemed to be unacceptably early when the dates initially appeared (Agrawal 1982a:193).

The Pre-Prabhas ceramics from Somnath are not Early Harappan in style. Vessel shapes, especially the smaller jars, bowls, and dishes, have an "affinity" with ceramics found in the Indus Valley. A more complete statement on this matter will have to await the appearance of a final report; however it is safe to say that the Pre-Prabhas ceramic vessel forms have a general "affinity" with that of the Harappans. The same is true for the fabrics of the Pre-Prabhas period, which tend to be dense red and buff wares.

The dates from Rojdi and the emergence of the Sorath Harappan have been so surprising that archaeologists

with an interest in Gujarat should begin a complete rethinking of their position on the synthesis of Harappan material there. Within such a restructuring the probable validity of the Somnath Period I dates should be accepted. New intensive exploration should also be directed toward the isolation of other sites with the Pre-Prabhas component, promoting the investigation of these early farming and herding peoples of Gujarat.

Surkotada

The Urban Phase Harappan is represented in Gujarat at a number of sites (Lothal, Pabumath, Desalpur), but probably most clearly at Surkotada in Kutch District. Dates are given in table 11.

Period IA. The Harappans at Surkotada founded their settlement on virgin soil. They created a "citadel" by building a massive rubble-faced wall of mud-bricks and clay lumps around their settlement, which was initially ca. 60 by 120 m. The significant ceramics of Period IA are the typical Harappan Black on Red painted ware as well as the unpainted redware. Vessel forms include the S-shaped jar, beaker, goblet, dish on stand, perforated jar, and cup with perforated lug handle. A red-slipped Polychrome Ware and a Polytone Cream Slipped Ware are present, along with a "Reserve Slipped Ware" which Joshi compares to materials from Mohenjodaro and Mesopotamia (J. P. Joshi 1972:124). Beads of steatite, lapis, carnelian, faience, and terra-cotta occur, as do copper rings, bangles, and a spearhead.

Period IB. During the middle period at Surkotada the "citadel" wall was renovated in a way that reduced the internal living space of the site. The Harappan Black on Red Ware continues, but in reduced frequency. A painted Coarse Red Ware, which began in the middle of Period IA, makes up some 70 percent of the total ceramic inventory of this occupation. Other wares also carry forward from Period IA, but only sporadically. Beads of agate, carnelian, steatite, and terra-cotta are recorded along with a heavy copper celt.

Period IC. The final period at Surkotada saw the almost complete reconstruction of the "citadel," with the addition of a "Lower Town," bastions, and a remodeled periphery wall. J. P. Joshi has noted the occurrence of a thick ash layer at the close of Period IB, and he speaks, rather darkly, of the "advent . . . of a people using a white painted Black and Red Ware" (1972:131). The intramural architecture of the site is impressive and rather well preserved during this period.

The typical Harappan wares continue as before, with the Indus pointed-bottom goblet having "a new lease on life" (J. P. Joshi 1972:133). The painted Coarse Red Ware of IB persists, but has been replaced by a very coarse, handmade redware as the predominant ceramic, apparently up to 70 percent of the total. There are a few decorated red or cream sherds as well as an unpainted Black and Red Ware that might have parallels with Lothal. The most interesting ceramic is the white-painted Black and Red Ware of the Ahar style (J. P. Joshi 1972:134). This never occurs in much quantity, only 4.5 percent, but is unmistakable. Distinctively Gujarati Harappan forms are also made in this ware (see J. P. Joshi 1972: fig. 12, no. 16).

A Summary Chronology for the Harappans in Gujarat (also see fig. 12)

Rangpur III	Late Post-urban Phase, Lustrous Red Ware	1700–1400 B.C.
Rojdi C, Lothal B, and Rangpur IIB/C	Early Post-urban Phase	2000–1700 B.C.
Rojdi A/B, Lothal A, Surkotada I, and Rangpur IIA	Urban Phase	2400–2000 B.C.

The Central Indian Chalcolithic

Malwa

A mature phase in the prehistory of western India emerges with the beginnings of the Malwa Complex in the region of the same name. The principal ceramic of this complex "culture" is a black- or brown-painted redware, which may shade into orange or buff. There are also a Cream Slipped Ware and two principal varieties of Bichrome Ware. Ahar-type white-painted Black and Red Ware is present at some sites as well.

The Malwa peoples cultivated wheat and barley and some rice. *Ragi,* a millet, comes from the Malwa levels of Daimabad (*Indian Archaeology: A Review* 1980–81b:106). Two forms of gram—lentils and the grass pea—are also documented. The Indian jujube, a collected plant, appears as well. Cattle, pigs, sheep, and goats were the mainstays among the domesticated animals, and there is evidence for the hunting of local wild ungulates.

Malwa houses were either small circular affairs about 3 m in diameter, or rectangular, 3.5 by 2.5 m on the average (Agrawal 1982a:223). Floors were formed of rammed earth and gravel which was carefully plastered with mud and lime. There are often many applications of this floor plaster within a single house, indicating prolonged use. The walls surrounding these floors, which can be well preserved, were formed of split bamboo, or other light building material. These were formed into screenlike affairs that may have been covered with mud daub. They were held in place by small posts driven into the perimeter. The conical, thatched roofs of the round

houses were complemented by gabeled coverings of the rectangular buildings.

The two Malwa sites about which we know the most are Navdatoli (Sankalia, Subbarao, and Deo 1958; Sankalia, Deo, and Ansari 1971) and Inamgaon (Sankalia 1977a; Sankalia, Ansari, and Dhavalikar 1975) (figs. 10 and 11). Other excavated sites, in alphabetical order, are Apegaon (Deo, Dhavalikar, and Ansari 1979), Daimabad (Sali 1986, 1982), Dangawada (Wakankar 1982; *Indian Archaeology: A Review* 1978–79:70–71, 1979–80: 54–55), Eran (*Indian Archaeology: A Review* 1960–61c:17–18, 1961–62c:24–25, 1962–63a:11–12, 1963–64b:15–16; U. V. Singh 1962), Nagda (*Indian Archaeology: A Review* 1955–56: 11–19), and Songaon (Deo and Majumdar 1969). There is also Malwa material at Kayatha.

Navdatoli

One of the best known of the Malwa Complex sites is Navdatoli. Dates for the four phases there are found in table 12.

There is a small amount of Lustrous Red Ware, as in Rangpur IIC and III, in all four of the Malwa phases at Navdatoli. This series of radiocarbon determinations gives a calibrated chronology for the Malwa occupation at Navdatoli as follows: Phases I and II, 2000–1600 B.C.; Phase III, 1600–1500 B.C.; and Phase IV, 1500–1400 B.C.

These dates generally agree with those from the Malwa occupations at Kayatha, Daimabad, and Barakhera, and Period II at Apegaon with a Malwa/Jorwe overlap. Dates for these sites are in tables 9, 10, and 12.

Dangawada

A recently excavated site known as Dangawada in Ujjain District of Madhya Pradesh (figs. 10 and 11) has five dates for the Malwa material of Period IB (*Indian Archaeology: A Review* 1979–80:54–55) given on table 12.

Eran

An eastern extension of the Malwa Complex seems to be present at the site of Eran (figs. 10 and 11), ca. 300 km northeast of Navdatoli (*Indian Archaeology: A Review* 1960–61c: 17–18, 1961–62c: 24–25, 1962–63a:11–12, 1963–64c:15–16; Singh 1962). The following is a short review of the stratigraphy of Eran:

Period IV	Medieval sculpture and coins.
Period III	Red Polished Ware and a black-painted redware. Coins of the western Kshatrapas and Nagas.
Period IIB	Predominance of redware, disappearance of Black and Red Ware. Iron, coins.
Period IIA	Black and Red Ware different from Period I. Northern Black Polished Ware (?). Iron.
Period I	Malwa ceramics, white-painted Black and Red Ware. Copper.

There are some differences among the various sources for the periodization of the radiocarbon determinations from Eran (compare Ramachandran 1975:37–40; Agrawal and Kusumgar 1974:115; Agrawal, Kusumgar, and Singhvi 1983:3, and the various date lists published in *Radiocarbon*). We have adhered to the information given in *Radiocarbon* when compiling table 12. A summary of this chronology is discussed below.

Inamgaon

At the large, extensively excavated site of Inamgaon, a Deccan College research team has reported the following sequence and summary chronology (figs. 10 and 11):

Period III	Late Jorwe	1200–900 B.C.
Period II	Jorwe	1500–1200 B.C.
Period I	Malwa	1700–1500 B.C.

The occupation of the site begins with Malwa material. This is comparable to that found at other sites already discussed. The scale of the Deccan College excavation has produced, however, by far the largest set of data. Radiocarbon determinations for Inamgaon I are given in table 12.

Summary

Radiocarbon dates suggest that the appearance of Malwa material at Inamgaon differs little from the time horizon of 1700 B.C. found in other parts of central India. Navdatoli may deviate from this chronology, but the radiocarbon determinations from this site are not internally consistent with respect to stratigraphy. Kayatha III also has dates that might indicate a somewhat earlier beginning for the Malwa Complex in the northern part of its range. But moving the beginnings of the Malwa back to 1800 or 1900 B.C. does not fit well with dates for Period I and II at Kayatha. These dates cast some doubt on the suggestion that the Malwa Complex began in the northern part of its range and spread to the south.

The Jorwe Complex

The Jorwe Complex directly follows, in fact emerges from, the Malwa material. The principal ceramic, the "Jorwe Ware," is a hard-fired redware with black paint on a red slip. A jar or pitcher with a nearly vertical spout rising from a carinated body is a hallmark vessel form, along with open bowls (see Sankalia et al. 1960:212–22 for good illustrations, some in color).

Jorwe settlements occur in virtually all parts of Maharashtra, save for the coastal lowlands known as the Konkan. The sites are closely associated with the well-known Black Cotton Soils which form above the bedrock Deccan Trap. These loams are good for dry farming because of their water retention properties. They are, however, very hard when dry and consequently difficult to plow, thus explaining some preference for Jorwe settlements to be located in riverine alluvial areas with looser soils. The list of cultivars used by the Jorwe folk differs little from the Malwa assemblage; however, better recovery techniques employed at the Jorwe site of Inamgaon (Kajale 1977) have given us a more detailed view of the plant economy.

According to D. P. Agrawal (1982a:235) the average Jorwe settlement was on the order of 2–3 ha, with "main centers" of 20 ha. The principal excavated sites are Jorwe (Sankalia and Deo 1955), Nevasa (Sankalia et al. 1960), Chandoli (Deo and Ansari 1965), Prakash (Thapar 1967), Songaon (Deo and Majumdar 1969), Inamgaon (Sankalia 1974:473–99; Sankalia, Ansari, and Dhavalikar 1975; Sankalia 1977a), Apegaon (Deo, Dhavalikar, and Ansari 1979), and Daimabad (Sali 1982). The site of Khed in Ahmednagar District also has two dates (Agrawal et al. 1977:231). At Inamgaon there is ceramic evidence for a Late Jorwe Phase.

Radiocarbon determinations for Jorwe sites are given in table 13. Based on these dates and an overall view of the Jorwe Complex, it is possible to give calibrated dates for the Early Jorwe as 1500–1200 B.C. The Late Jorwe immediately follows this and lasts into the first millennium B.C., although there are no radiocarbon determinations with readings this late. One of the principals in the excavations at Inamgaon summarizes the stratigraphy as follows:

> the earliest settlement at the site, that of the Malwa Culture—which flourished from ca. 1600–1400 B.C.—is . . . extensive. The size of the habitation increases during the Early Jorwe Period, but it again shrinks in the Late Jorwe Period. It is important to note that whereas almost all of the chalcolithic sites in the Tapti and the Pravara-Godavari valleys were deserted around 1000 B.C. habitation at Inamgaon continued until ca. 700 B.C. (Dhavalikar 1977:46–47)

The centuries encompassing the Late Jorwe are critical in central India. Following this period there is a transition from the chalcolithic village farming community to the Iron Age and to the Indian Megaliths. No iron has yet been found in a central Indian Chalcolithic site. Those occupied during the Late Jorwe period do admit such a possibility, since iron dated to ca. 1000 B.C. has been found at Hallur (Nagaraja Rao 1971:14, 91–92). More is said of the Iron Age following a discussion of the early food-producing communities in South India.

The Southern Neolithic

Settled agriculture in South India begins in the second half of the third millennium with the appearance of what is now called the Southern Neolithic (fig. 13). These materials are "neolithic" in the sense that there is evidence for agriculture and stock raising, pottery, ground stone, and village farming communities. Copper, bronze, and gold seem to occur in all but its earliest horizons.

It has already been noted that ceramics like the Blotchy Gray Ware, found at pre-Malwa sites like Daimabad, Songaon, and Bahal on the Deccan, have a resemblance to Southern Neolithic ceramics. This corresponds in time with the earliest stages of the Southern Neolithic. It seems, then, that at the end of the third millennium and the beginning of the second millennium these food producers inhabited a substantial part of peninsular India. In the north (Madhya Pradesh and Maharashtra) their ceramic assemblage was replaced first by the Malwa and then by the Jorwe Complexes. There is, however, some evidence for continued interaction between these regions throughout the second millennium (Dhavalikar 1970 and below).

Settlements of the Southern Neolithic found in virtually all of Karnataka (formerly Mysore), southwestern Andhra Pradesh, and northern Tamil Nadu are associated with the granite hill slopes and riverine settings of the region. The sites are small and many seem to be temporary, possibly forest herding camps, with a food economy based on cattle, millets, and pulses. A curious feature of some settlements is the presence of mounds of dung with evidence of periodic, large-scale burning (Zeuner 1959; F. R. Allchin 1963).

There has been a fair amount of excavation at settlements and ash mounds of the Southern Neolithic. In alphabetical order the principal sites are Brahmagiri (Wheeler 1947–48), Hallur (Nagaraja Rao 1971), Hemmige (Hanumantha Rao and Nagaraju 1974), Kodekal (Paddayya 1973), Kupgal (Majumdar and Rajaguru 1966), Maski (Thapar 1957), Paiyampalli (*Indian Archaeology: A Review* 1964–65c:22–23, 1967–68a:26–30), Palavoy (Rami Reddy 1976), Piklihal (F. R. Allchin 1960), Polakonda (*Indian Archaeology: A Review* 1975–76a:5, 1976–77a:10), Sangankallu (Ansari and Nagaraja Rao 1969), Tekkalakota (Nagaraja Rao and Malhotra 1965), Terdal (*Indian Archaeology: A Review* 1965–66:34), Tirumukkudal Narsipur (*Indian Archaeology: A Review* 1961–62e:35–36, 1964–65c:32), and Utnur (F. R. Allchin 1961). Bridget and Raymond Allchin (1982:287) have organized a three-period synthesis of the

Southern Neolithic which we have used to organize the radiocarbon chronology given in table 14.

Period I of the Southern Neolithic

Period I of the Allchin scheme has only ash mound sites associated with it. These seem to represent forest stations where cattle and possibly other animals were kept or captured from the forest by means of drives (F. R. Allchin and B. Allchin 1974:71–77). The periodic burning of the dung has ethnohistoric parallels, and F. R. Allchin has a fascinating study of this material (1963). The presence of querns, stone rubbers, and the like indicates the probability of cultivation. Ground stone axes are present along with a chipped stone industry that has strong techno-typological ties to the preceding period of settlement which was dominated by sites with microliths (B. Allchin and F. R. Allchin 1968:166). The ceramics of Period I are handmade graywares, which may run to buff-brown. Both red and black slips are attested with some painting in purple. These wares resemble the Blotchy Gray Ware of Songaon, Bahal, and Daimabad. There is no metal in the Allchins' Period I.

Period II of the Southern Neolithic

Period II marks the introduction of significantly more substantial settlement, and ash mounds are complemented by purely domestic sites. These latter may consist of houses, sometimes round wattle and daub affairs with plastered floors. They are likely to be found on the tops of granite hills, or on terraces cleared on their slopes. The ground stone industry continues as in Period I, with a profusion of axes, and continuity in the chipped stone can be noted as well. Copper and bronze appear for the first time as in the Piklihal Upper Neolithic (F. R. Allchin 1961:107–8), Tekkalakota I (Nagaraja Rao and Malhotra 1965:75), and Hallur Ib (Nagaraja Rao 1971:10). Karnataka is famous as a gold-mining state, and it is perhaps not surprising that two gold ornaments can be attributed to Tekkalakota I, along with copper implements (Nagaraja Rao and Malhotra 1965:75). Period II ceramics differ little from their Period I counterparts. The Allchins mention the introduction of spouted and perforated vessels and the roughening of exterior pottery surfaces as possible signs of contact with more northern reaches of the peninsula.

Period III of the Southern Neolithic

The settlement patterning of Period III is quite stable, but there are significant changes in the ceramics. The unburnished gray and buff-brown wares disappear. A dull red-ware with black painting appears in quantity. Spouted vessels and jars with severely constricted necks are also a part of the new inventory. The new features, plus something approaching the Jorwe Black on Red Ware, may indicate contacts with the north (Agrawal 1982a:111). Agrawal also makes the point that the Black and Red Ware of the Indian Megalithic seems to have been derived from Southern Neolithic Period III ceramics. Metal, especially copper and/or bronze, appears in some quantity (see references above) in both ornaments and tools. The flat axes or adzes are of particular interest in that they are indistinguishable from tools found at Jorwe sites, or even at places like Ganeshwar, or possibly at Harappan sites (see above).

A summary chronology for the three phases of the Southern Neolithic is as follows: Phase III, 1600–1000 B.C.; Phase II, 2000–1600 B.C.; and Phase I, 2500–2000 B.C.

The Transition to the Megaliths of the South Indian Iron Age

We close this chapter with a short review of one of the most perplexing problems in South Asian archaeology: the emergence of the Megalithic Complex of South India (see table 14 for transition dates).

M. S. Nagaraja Rao has kindly given us information that may clarify this situation. Continuity between the Neolithic and Megalithic periods can be seen in ceramics, especially the Hallur white-painted Black and Red Ware. This is found at places like Komarana-Halli, 12 km east of Hallur, and at Tadakana-Halli, 4 km west of the site. Komarana-Halli also has multispouted vessels, like those found at Hallur.

Nagaraja Rao informs us (pers. comm.) of a TL date of ca. 1000 B.C. for Komarana-Halli. This is congruent with dates from the transitional period at Hallur (TF-570, TF-573, and TF-575 given above) which calibrate to ca. 1400–1100 B.C. Period II at Hallur has produced a number of iron implements.

The dates for the transition from the Southern Neolithic to the Megalithic from Payampalli and Palavoy which have just been presented should also be considered. While they are very early for a traditional view of this problem, there is no reason to dismiss them out of hand.

There is, then, strong evidence for continuity between the Neolithic and Iron Age in the southern reaches of the peninsula. The evidence also suggests that we should look for the causes of the transition within South India rather than across the seas.

Concluding Statement

There has been a great deal of research on the prehistoric communities of India and surrounding countries. Many recent discoveries are important and intriguing, but the

chronology within which these findings can be placed is far from clear. It is not that there is a simple lack of precision in the dating. Some areas, such as the mid-Ganges plain and the Belan Valley, still have significant internal inconsistencies in their prehistoric chronologies. In other parts of the country, such as Malwa and the Deccan plateau, there has been a great deal of careful research, and the "skeleton of history" is much clearer. However, in the construction of a chronology there remain more questions than sound answers, and these call for a continued dedication to carefully conceived, problem-oriented field research.

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Gregory L. Possehl
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India

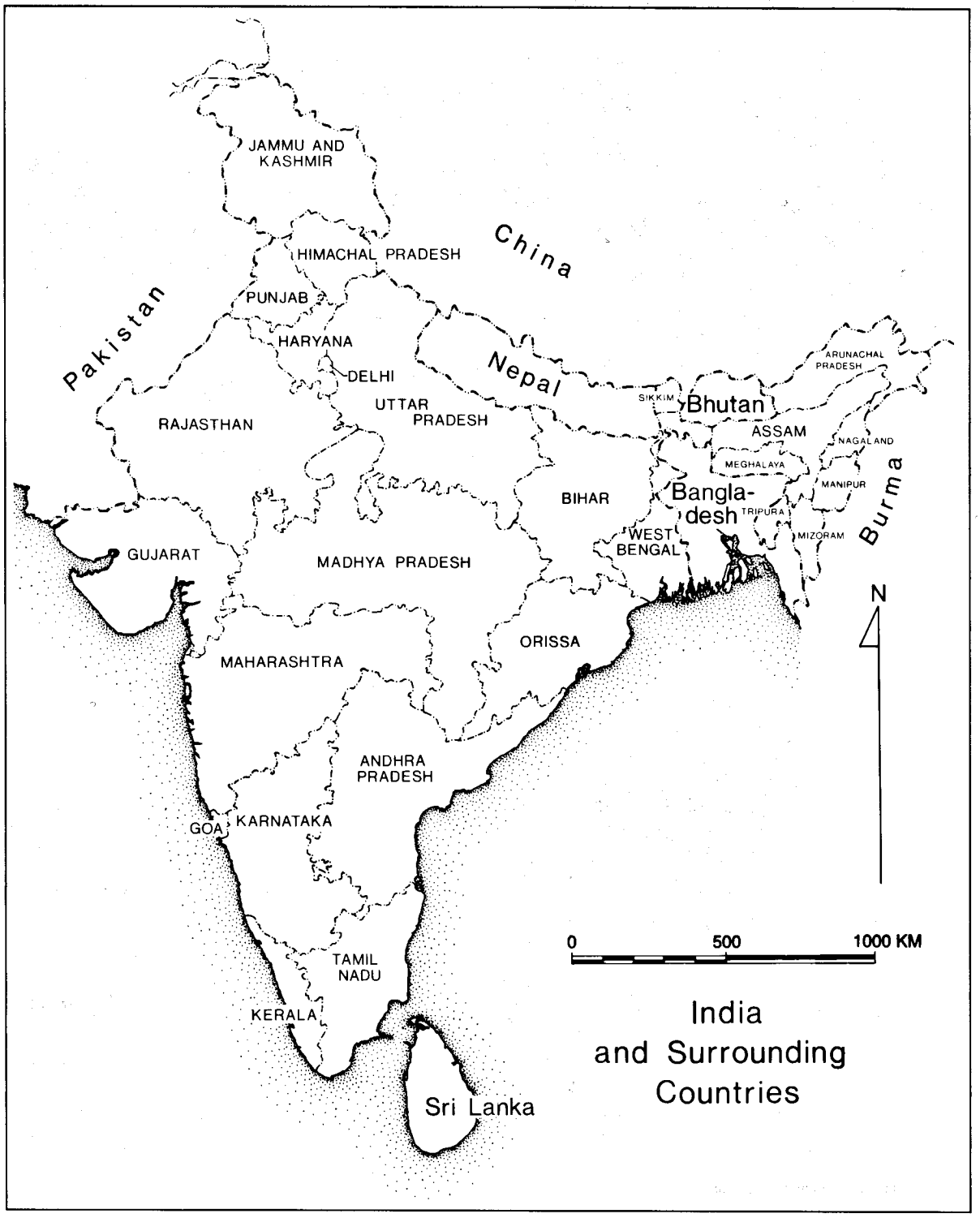


Fig. 1. The states of India.

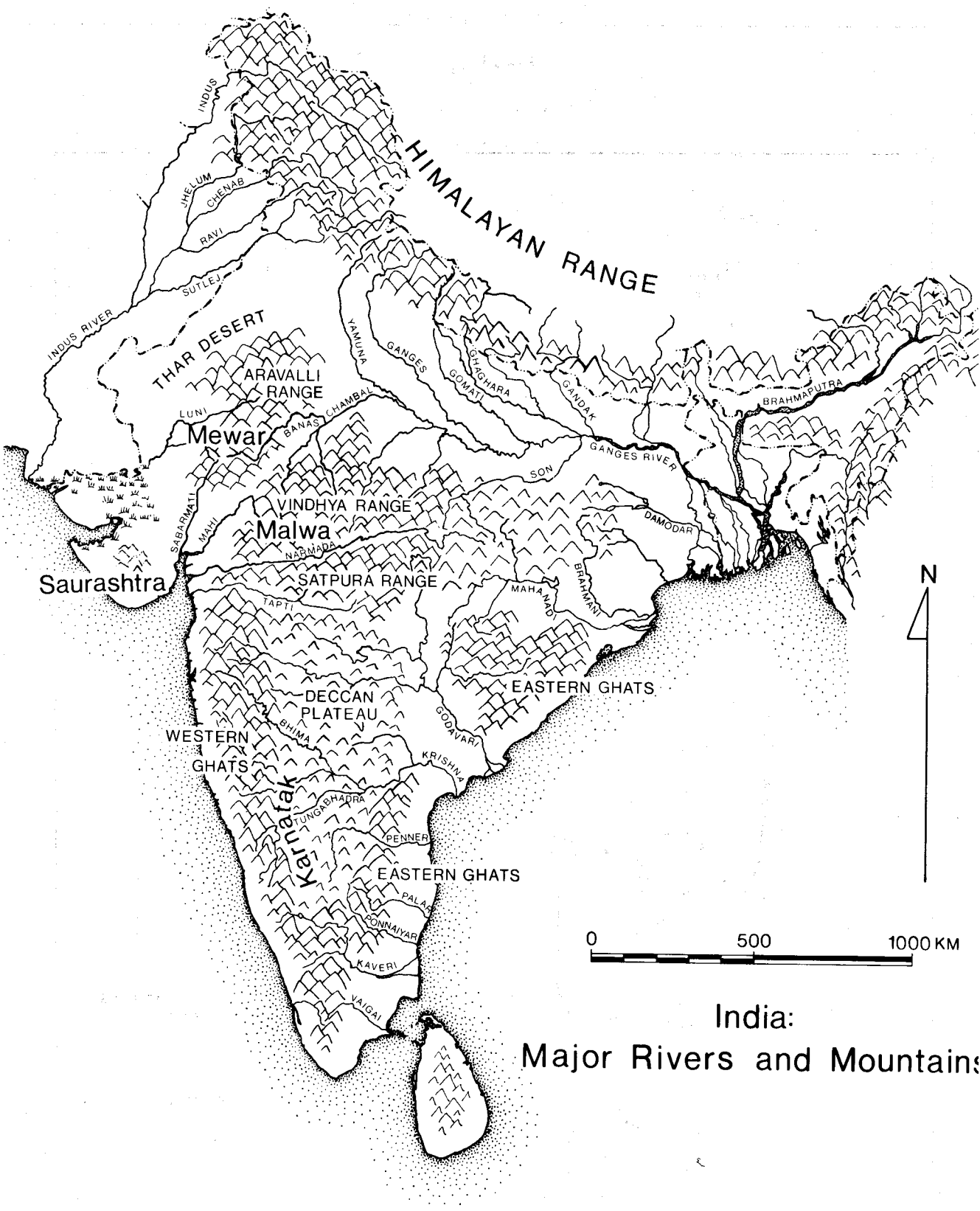


Fig. 2. India's major rivers and mountains.

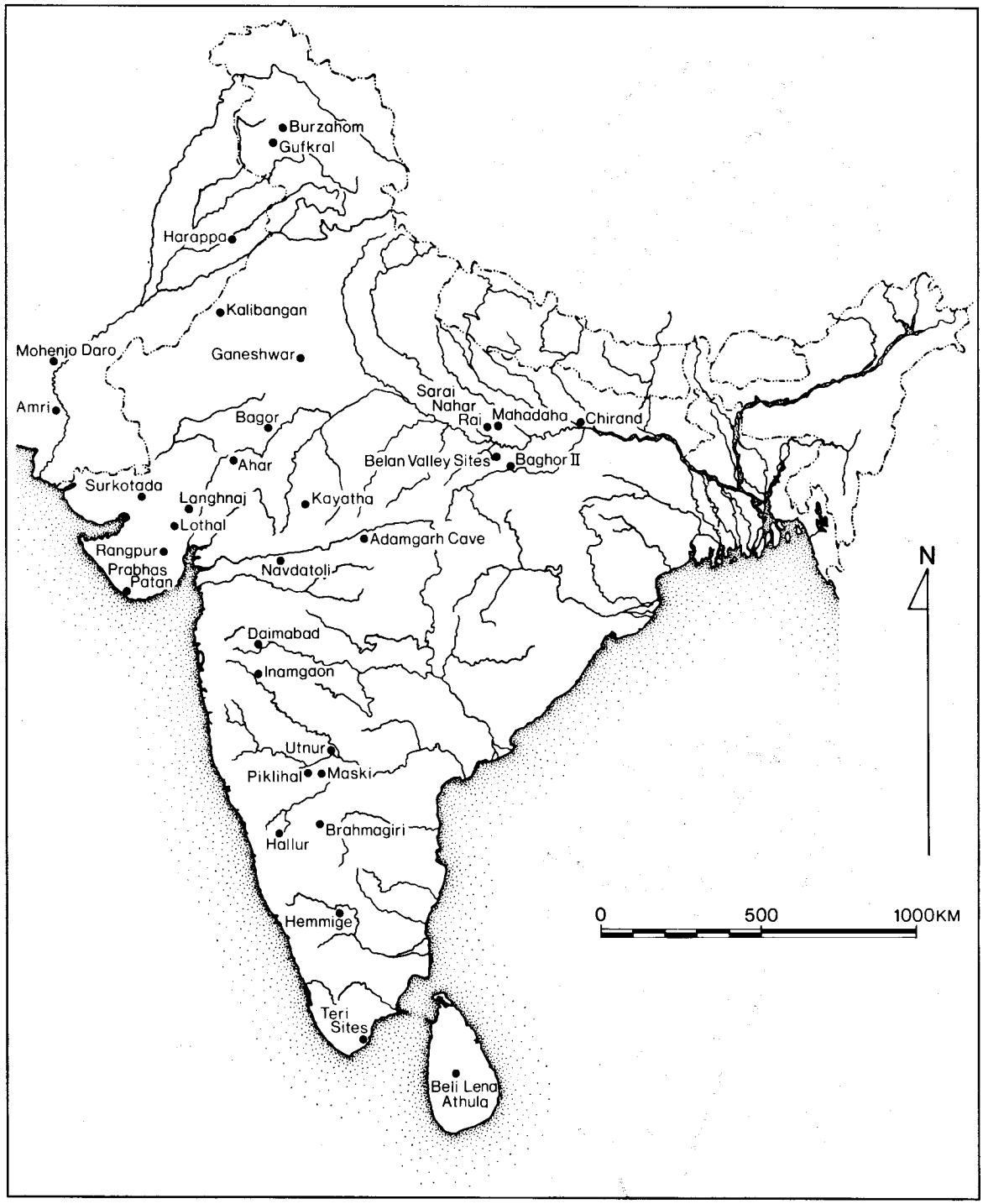


Fig. 3. Principal sites mentioned in the text.

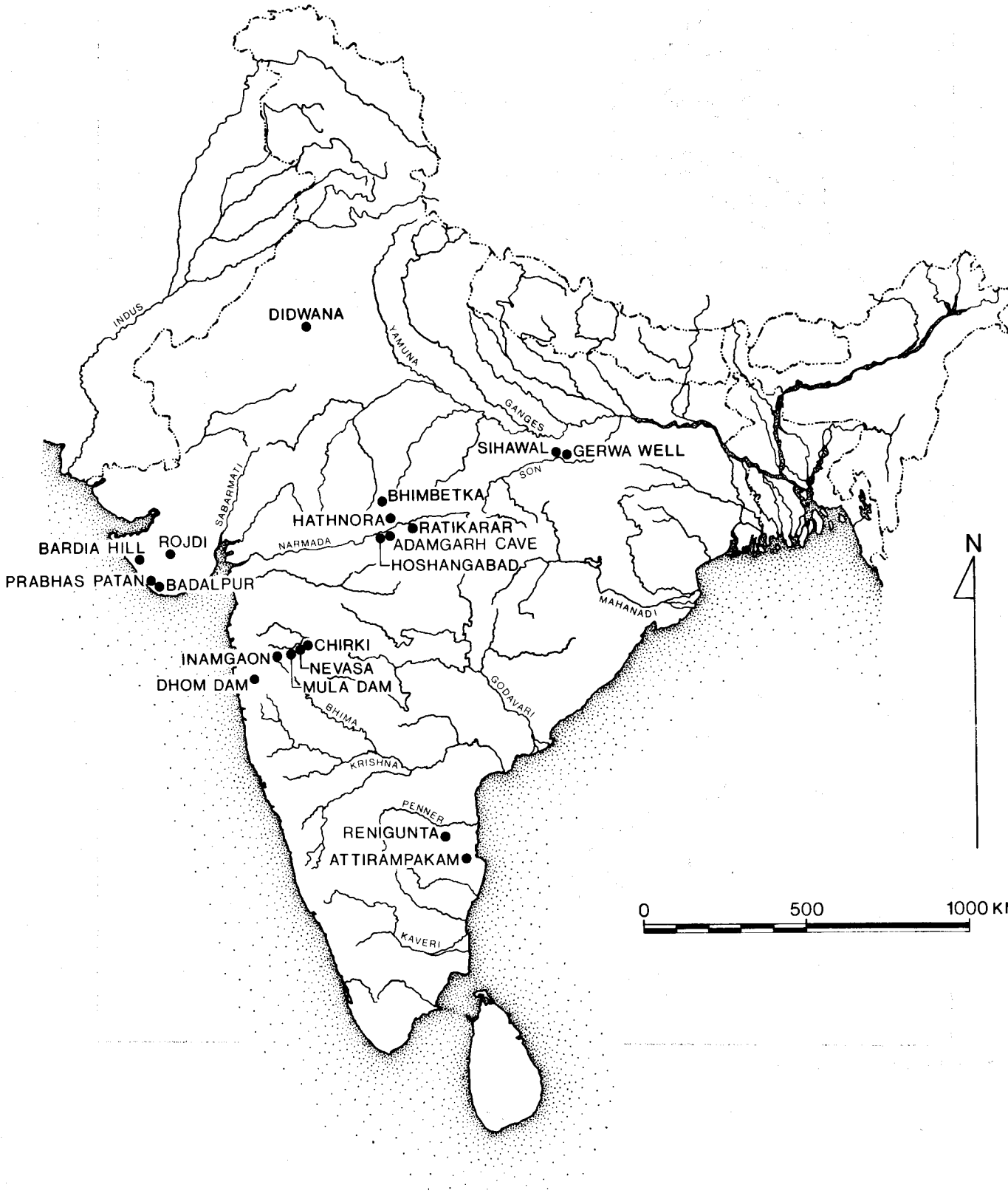


Fig. 4. Lower and middle Paleolithic sites in India.

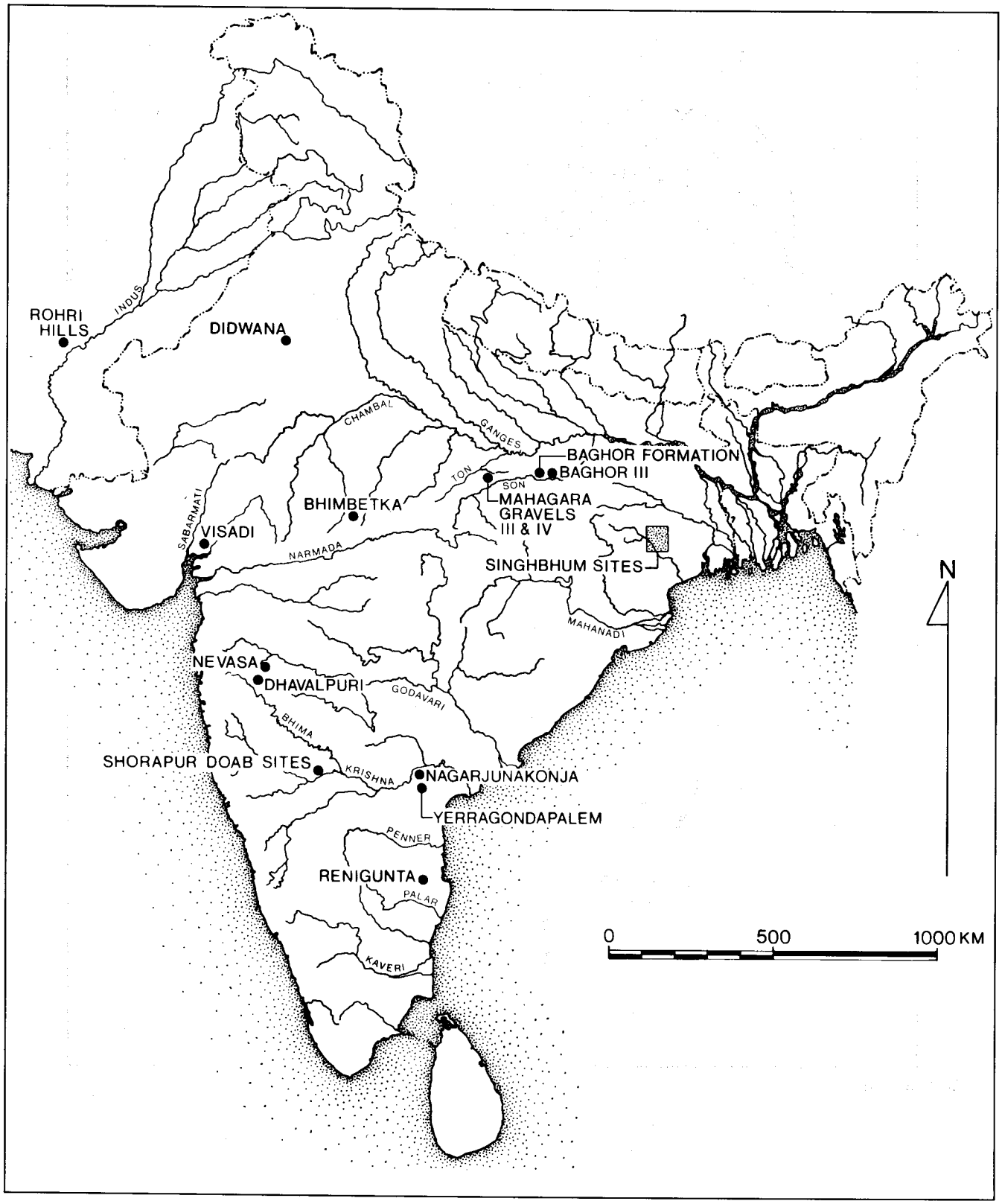


Fig. 5. Upper Paleolithic sites in India.

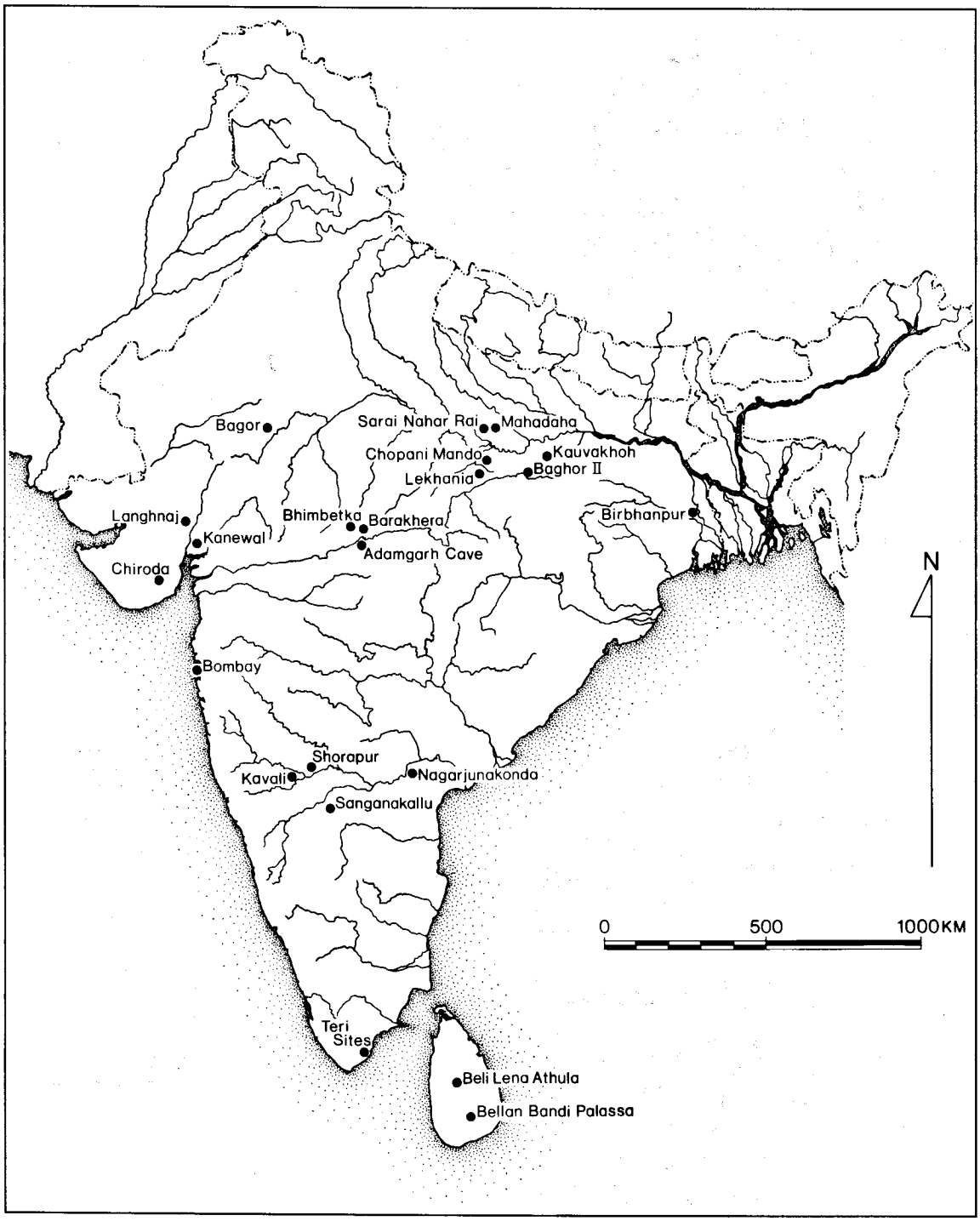
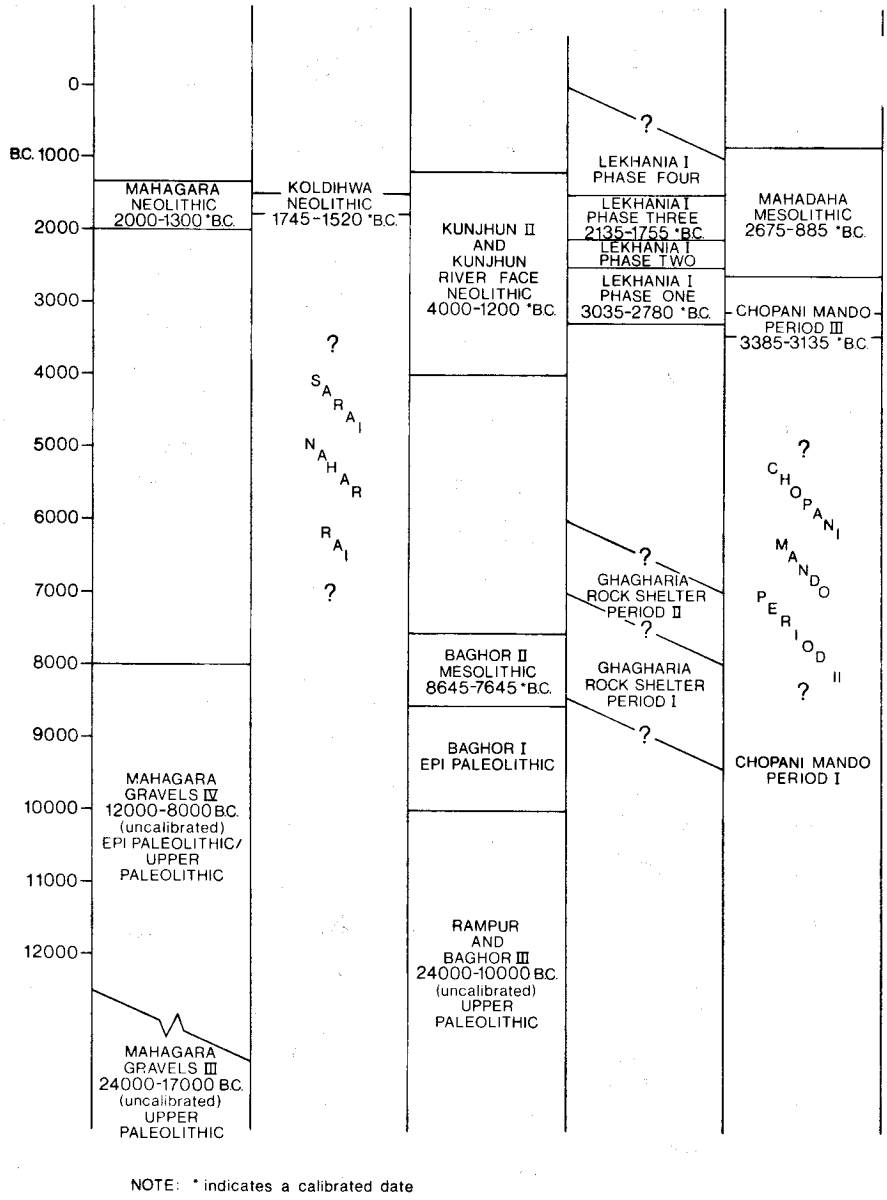


Fig. 6. Sites with microliths.



NOTE: * indicates a calibrated date

Fig. 7. Chronological chart for sites in the Belan and Son valleys.

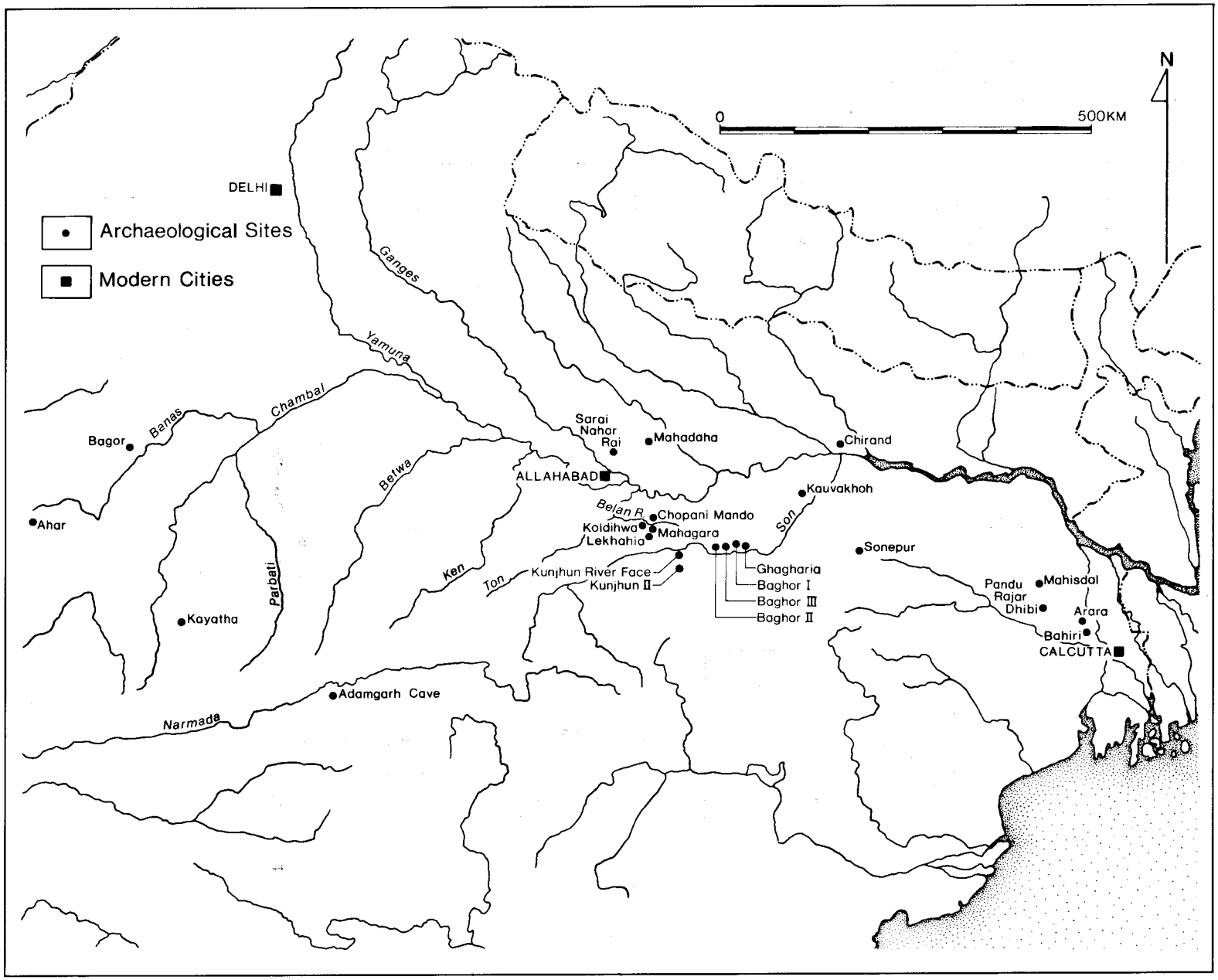


Fig. 8. Sites in northern India.

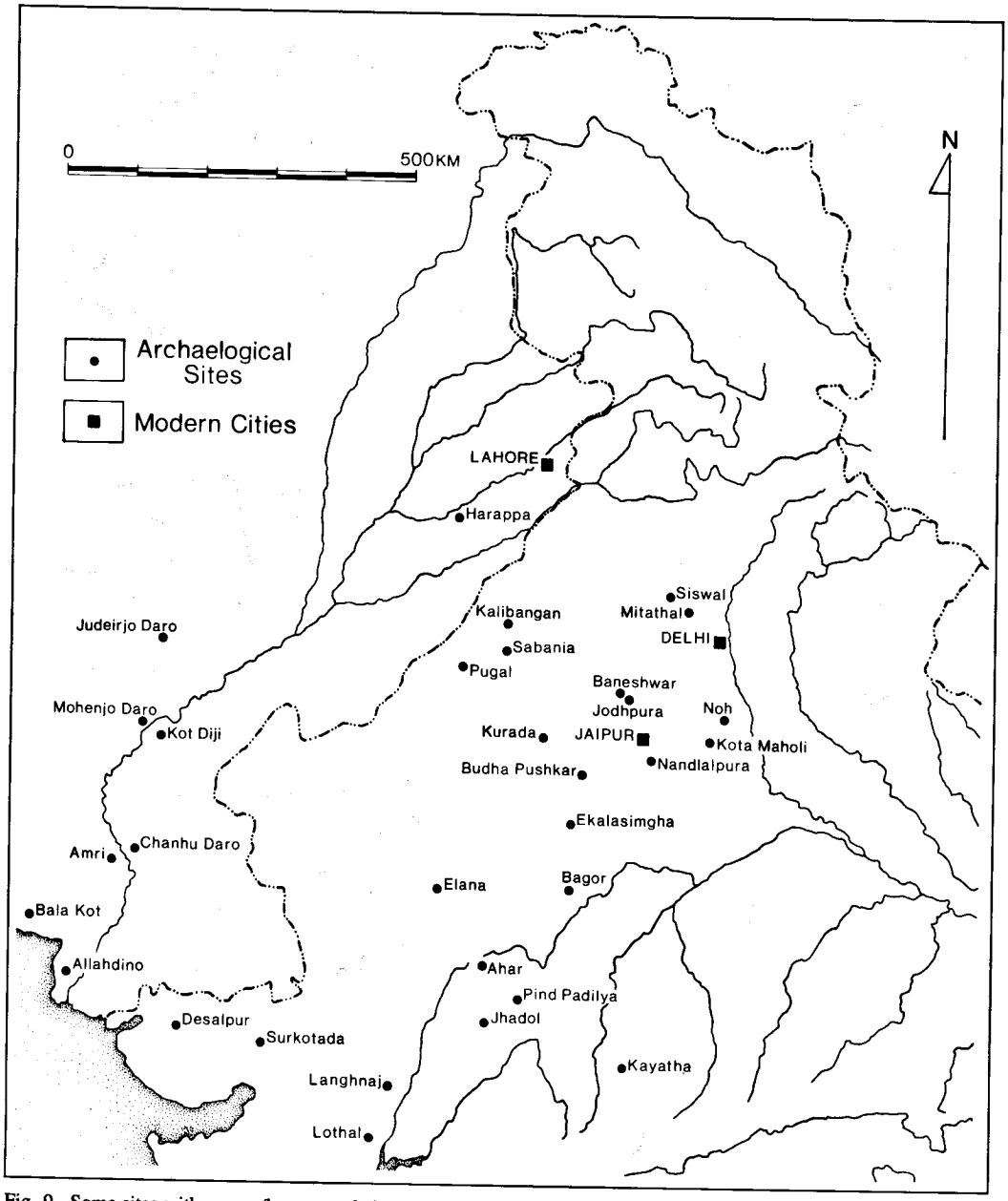


Fig. 9. Some sites with copper/bronze tools in northwestern South Asia.

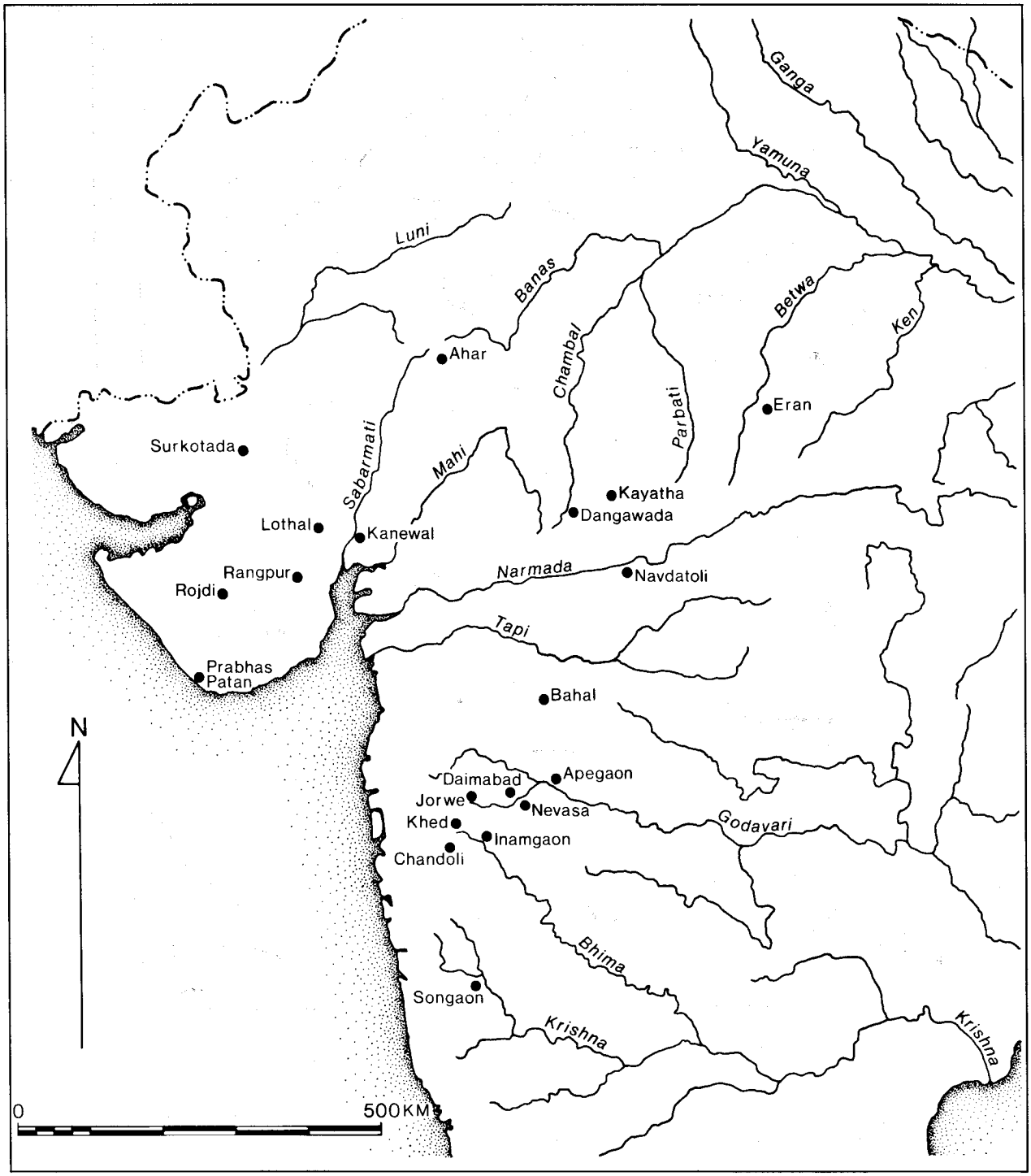


Fig. 10. Early food-producing sites in western India.

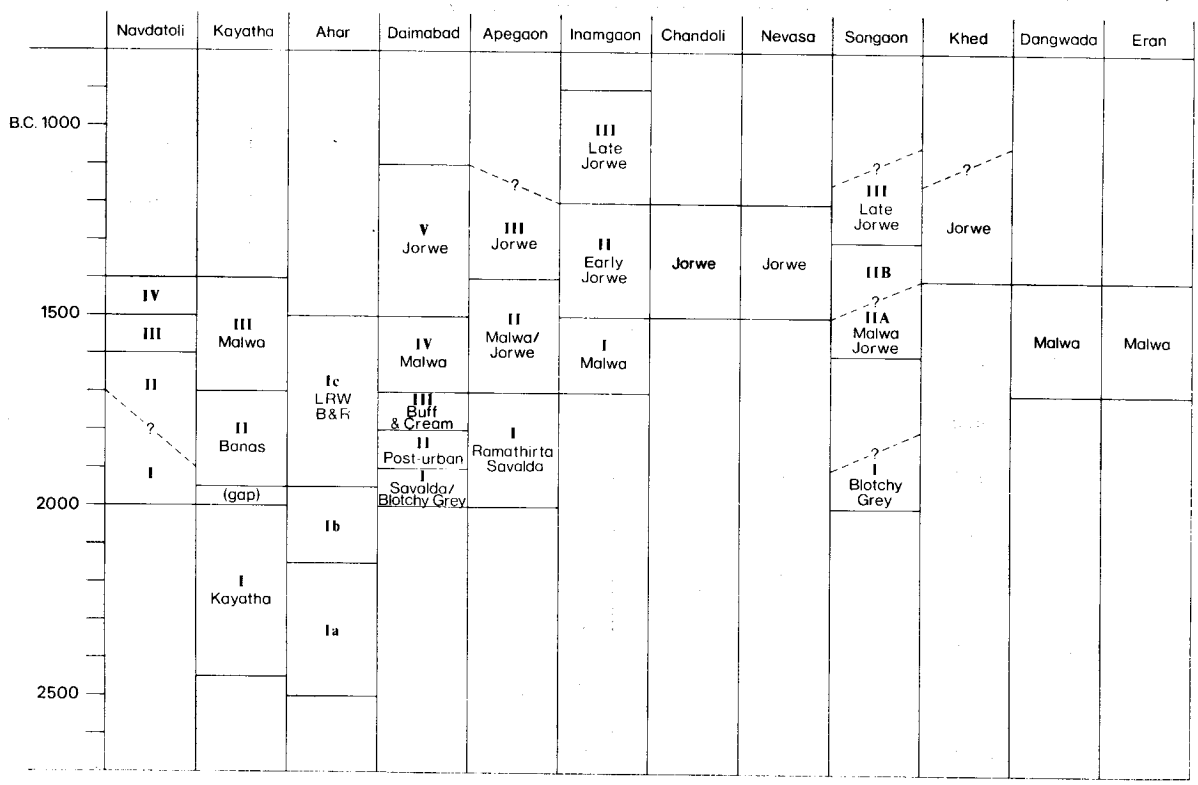


Fig. 11. Chronological chart of early villages in northern and central India.

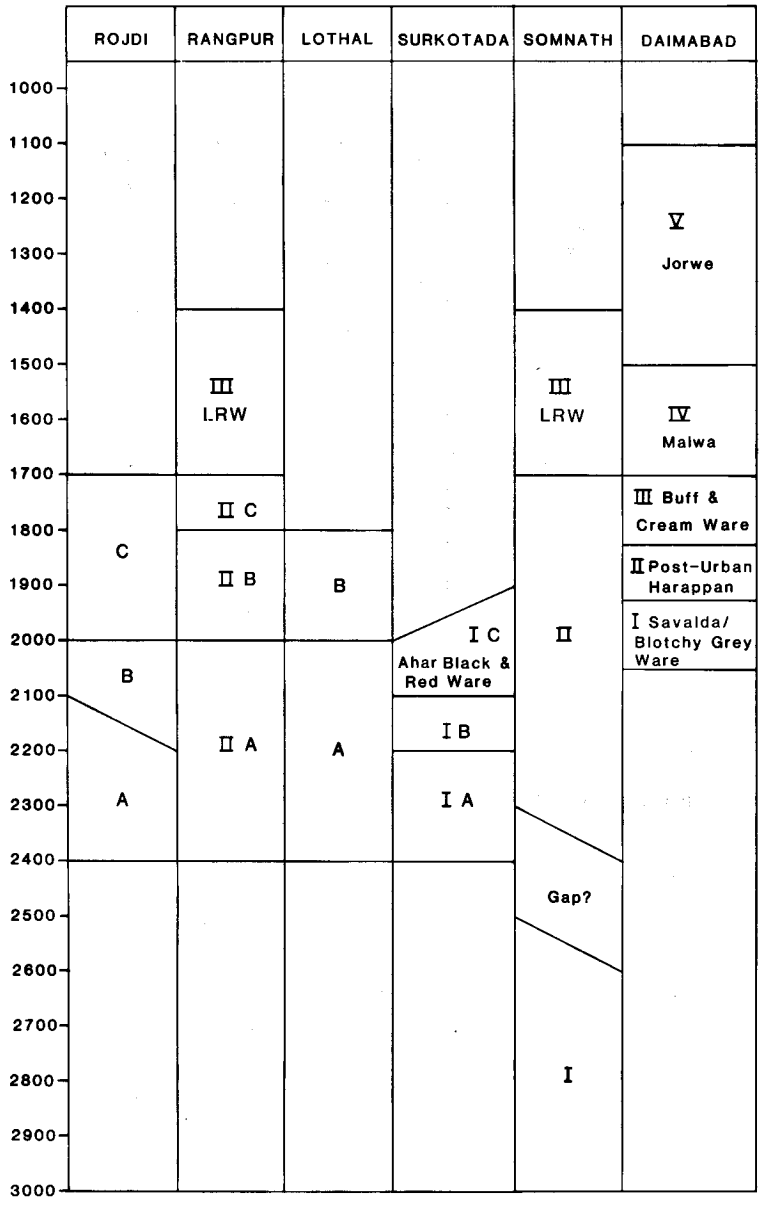


Fig. 12. Chronology of some Harappan sites.

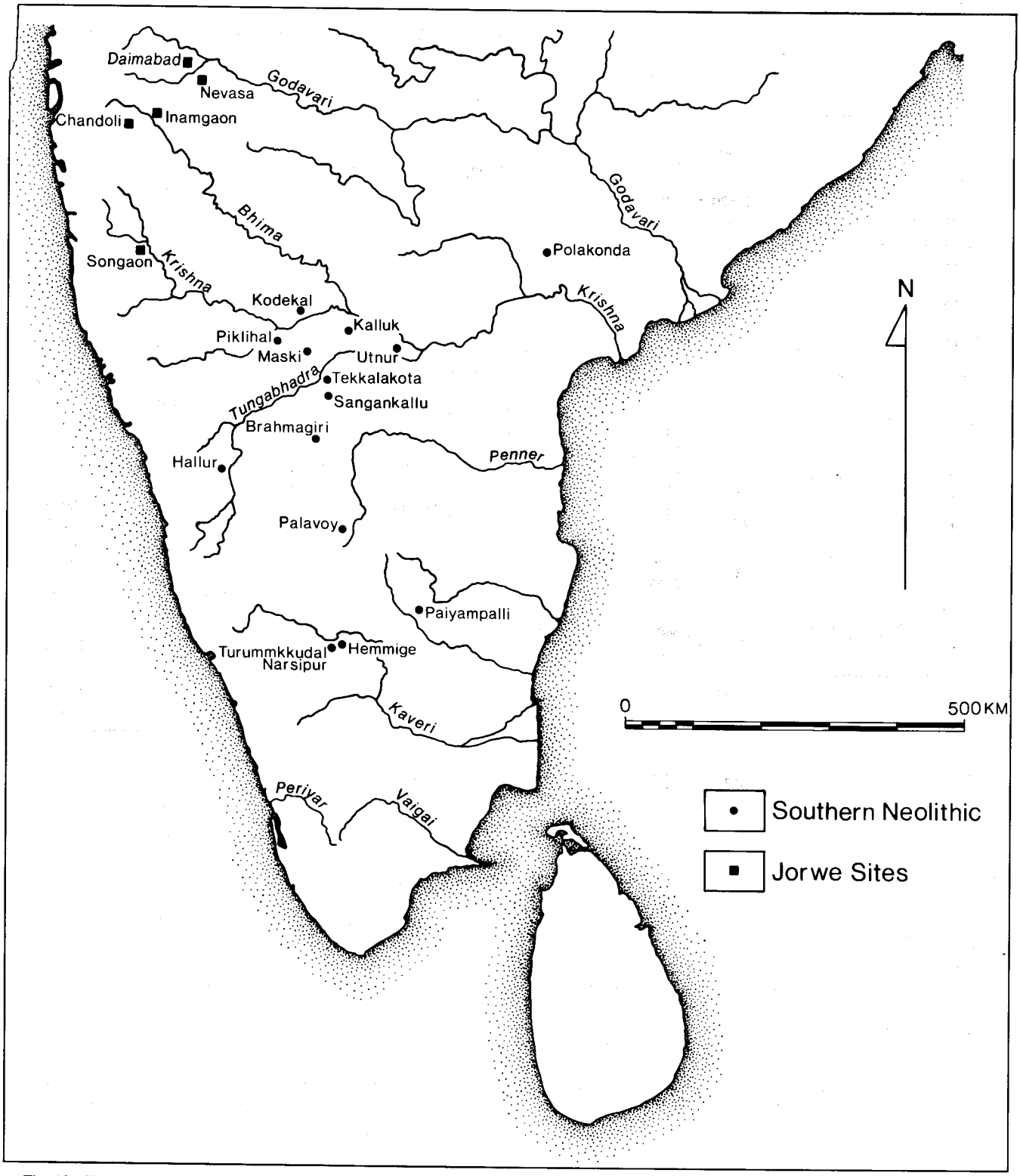


Fig. 13. Sites of the Southern Neolithic mentioned in the text.

Table 1 Radiocarbon Dates for the Indian Middle Paleolithic

Site	Half-life 5568 b.p.	5730 B.C.
Badalpur, Gujarat		
PRL-88	24300 $^{+1700}_{-1400}$	23080
Bardia Hill, Gujarat		
TF-764b	11420 ± 190	9810
TF-764a	16485 ± 445	15030
Bhimbetka, Madhya Pradesh		
PRL-787	15370 $^{+570}_{-530}$	13880
PRL-788	17230 $^{+480}_{-440}$	15795
PRL-789	17670 $^{+490}_{-460}$	16250
Dhom Dam, Maharashtra		
TF-1004	37640 $^{+9200}_{-4245}$	36820
Gerwa Well, Madhya Pradesh		
PRL-710	26090 $^{+800}_{-720}$	24925
Inamgaon, Maharashtra		
TF-1177	18750 ± 350	17360
TF-1003	19775 $^{+630}_{-580}$	18420
Mula Dam, Maharashtra		
TF-345	31075 $^{+5550}_{-3254}$	30050
TF-217	>39000	
Nandipali, Andhra Pradesh		
PRL-293	23670 $^{+640}_{-690}$	22430
Nirgudsar, Maharashtra		
PRL-609	>31000	
Prabhas Patan, Gujarat		
PRL-30	20825 $^{+670}_{-540}$	19500
Ratikarar, Madhya Pradesh		
TF-967	32750 $^{+1770}_{-1580}$	31780

Table 2 Radiocarbon Dates for the South Asian Upper Paleolithic

Site	Half-life 5568 b.p.	5730 B.C.
Asla, Maharashtra		
TF-1178	9750 ± 120	8090
Baghor Formation, Madhya Pradesh		
Beta-4792	11525 ± 120	9920
PRL-711	12450 $^{+220}_{-210}$	10875
SUA-1420	10415 ± 140	8775
Beta-4793	25485 ± 420	24300
Baghor III, Madhya Pradesh		
PRL-714	6460 ± 180	4705
Ghargaon, Maharashtra		
TF-1111	10020 ± 150	8370
Mahagara Gravels III, Madhya Pradesh (Upper Paleolithic)		
TF-1245	19160 ± 330	17785
PRL-86	25070 $^{+810}_{-730}$	23870
Mahagara Gravels IV, Madhya Pradesh (Upper Paleolithic/Microlithic)		
SUA-1421	9740 ± 115	8080
BS-131	9830 ± 160	8175
PRL-602	10980 ± 190	9360
BS-130	11550 ± 180	9945
PRL-603	13740 $^{+400}_{-380}$	12200
Patne		
GRN-7200	24270 ± 195	23050
Sangamner, Maharashtra		
PRL-470	14400 $^{+340}_{-320}$	12880
BS-78	24670 ± 710	23460

Table 3 Radiocarbon Dates for Selected Microlithic Sites in India

Site	Half-life 5568 b.p.	Half-life 5730 B.C.	CRD 1 σ B.C.
Baghor Formation, Madhya Pradesh			
SUA-1422	5305 ± 90	3515	4110–3795
Baghor II, Madhya Pradesh			
PRL-715	8090 ± 220	6380	
Barkhera, Madhya Pradesh (possibly with microliths)			
PRL-113	7250 ± 135	5520	6010–5010
Batadombalena Cave, Sri Lanka			
PRL-855	11200^{+330}_{-320}	9585	no calibration
PRL-856	12770^{+470}_{-450}	11200	no calibration
PRL-858	15390^{+610}_{-570}	13900	no calibration
PRL-920	20150^{+740}_{-680}	18805	no calibration
PRL-857	27700^{+2090}_{-1660}	26580	no calibration
Beli-lena Kitugala, Sri Lanka			
FRA-93	8700 ± 220	7011	no calibration
FRA-91	11780 ± 220	10183	no calibration
PRL-861	11910^{+430}_{-410}	10320	no calibration
Beli-lena Athula, Sri Lanka			
TF-1094	7640 ± 110	5920 B.P.	6420–5420
Bhimbetka, Madhya Pradesh			
PRL-321	370 ± 130	A.D. 1570	no calibration
PRL-314	630 ± 100	A.D. 1300	no calibration
PRL-536	950 ± 110	A.D. 970	A.D. 895–1240
PRL-311	1060 ± 80	A.D. 860	A.D. 755–920
PRL-535	1160 ± 150	A.D. 755	A.D. 715–865
PRL-315	1760 ± 180	A.D. 135	A.D. 10–465
PRL-316	1930 ± 100	40	35 B.C.–A.D. 95
PRL-51	2050 ± 110	160	185 B.C.–A.D. 35
PRL-310	2320 ± 100	440	445–375
PRL-317	2490 ± 100	615	795–420
PRL-18	2650 ± 125	780	910–755
PRL-534	2780 ± 150	910	1125–795
PRL-306	2820 ± 110	955	1125–825
PRL-318	3560 ± 100	1715	2135–1755
PRL-50	5860 ± 110	4085	4950–4560
PRL-17	7570 ± 210	5845	no calibration
Kauvakhoh, Mirzapur			
PRL-907	1040 ± 130	A.D. 880	A.D. 860–1200
Oriyo Timbo (Chiroda), Gujarat			
PRL-888 & 889	4720 ± 160	2910	3670–3360

Table 4 Radiocarbon Dates for Selected Microlithic Sites and Early Food-Production Sites in India

Site	Half-life 5568 b.p.	Half-life 5730 B.C.	CRD 1 σ B.C.
Adamgarh Cave, Madhya Pradesh			
TF-116	2765 ± 105	900	905–785
TF-120	7240 ± 125	5505	6410–5705
Bagor, Phase I			
TF-1011 & 1012	5090 ± 80	3290	3955–3775
TF-1007	5620 ± 125	3840	4560–4405
TF-786	6245 ± 200	4480	5365–4965
Chopani Mando			
BS-129	4540 ± 110	2725	3385–3135
Koldihwa Neolithic			
PRL-223	3300 ± 120	1450	1745–1520
PRL-101	6300 ± 180	4540	5410–5010
PRL-100	7180 ± 230	5445	6375–5645
Kunjhun River Face			
Beta-4879	3120 ± 70	1265	1565–1265
Beta-6414	4010 ± 110	2180	2675–2515
Beta-6415	4600 ± 80	2790	3530–3335
Lekhahia I, Phase Three, Madhya Pradesh			
TF-417	3560 ± 105	1715	2135–1755
Lekhahia I, Phase One, Madhya Pradesh			
TF-419	4240 ± 110	2415	3035–2780
Mahadaha			
BS-137	2880 ± 250	1015	1385–815
BS-138	3840 ± 130	2005	2550–2125
BS-136	4010 ± 120	2180	2675–2515
Mahagara Neolithic			
PRL-408	3190 ± 110	1335	1670–1375
PRL-409	3260 ± 150	1410	1745–1390
PRL-407	3300 ± 100	1450	1745–1520
BS-128	3330 ± 100	1480	1770–1545
Sarai Nahar Rai			
TF-1356 & 1359	2860 ± 120	995	1140–865
TF-1104	10050 ± 110	8400	no calibration

Table 5 Radiocarbon Dates for Microlithic Sites and Interactive Trade and Barter

Site	Half-life 5568 b.p.	Half-life 5730 B.C.	CRD 1 σ B.C.
Bagor, Phase II			
TF-1005 & 1006	3945 ± 90	2110	2650–2315
Bagor, Phase I/II			
TF-1009	4585 ± 105	2775	3395–3160
Jodhpura, Post OCP			
PRL-275	4360 ± 160	2540	3360–2880
Jodhpura, OCP			
PRL-277	2610 ± 110	740	850–755
PRL-278	4060 ± 170	2230	2895–2515
Langhnaj, Gujarat (microliths, pottery, copper knife)			
TF-744	3875 ± 105	2041	2495–2180

Table 6 Radiocarbon Dates for the Kashmir Neolithic

Site	Half-life 5568 b.p.	Half-life 5730 B.C.	CRD 1 σ B.C.
Burzahom Neolithic, Period IB			
TF-15	3390 ± 105	1540	1880–1595
TF-127	3935 ± 110	2100	2645–2310
TF-128	4205 ± 115	2380	2980–2655
Burzahom Neolithic, Period IA			
TF-123	4055 ± 110	2225	2870–2525
Dates from Burzahom assigned only to the "Neolithic"			
TF-10	2580 ± 100	705	825–600
TF-129	3670 ± 90	1830	2215–1900
TF-13	3690 ± 125	1850	2335–1885
TF-14	3860 ± 340	2025	?
Gufkral Neolithic, Period IC			
BS-360	3243 ± 95	1390 ± 100	1695–1410
BS-370	2709 ± 105	840 ± 110	1130–800
BS-371	3466 ± 95	1620 ± 95	1965–1680
Gufkral Neolithic, Period IB			
BS-359	3864 ± 115	2030 ± 120	2640–2150
BS-356	3466 ± 105	1620 ± 110	2000–1665
BS-357	3369 ± 105	1520 ± 110	1895–1545
Gufkral Neolithic, Period IA			
BS-358	3039 ± 105	1180 ± 110	1545–1100

Table 7 Radiocarbon Dates for Sohgaura and Sites in the Eastern Ganges

Site	Half-life 5568 b.p.	Half-life 5730 B.C.	CRD 1 σ B.C.
Arara, West Bengal—Black and Red Ware Phase			
PRL-931	2780 ± 120	910	1110–810
Bahiri, West Bengal—Chalcolithic Phase			
PRL-867	2490 ± 150	615	810–410
PRL-866	2770 ± 140	900	1120–795
Barudih, Bihar—Neolithic Phase			
TF-1101	2475 ± 85	600	790–415
TF-1102	2540 ± 90	665	810–565
TF-1099	2625 ± 105	755	875–765
TF-1100	2920 ± 200	1060	1410–830
Bharatpur, West Bengal—Period I, Black and Red Ware			
PRL-188A	2770 ± 140	905	1120–795
PRL-187	3040 ± 150	1180	1545–1100
PRL-15	3290 ± 135	1440	1770–1410
Chirand, Bihar—Chalcolithic			
TF-444	2590 ± 105	720	830–745
TF-1029	2915 ± 85	1050	1345–1020
TF-1028	3390 ± 90	1540	1880–1595
TF-1030	3430 ± 100	1585	1910–1665
TF-445	3500 ± 100	1655	1990–1695
Chirand, Bihar—Neolithic			
TF-1126	2290 ± 120	410	430–360
TF-1036	2485 ± 120	610	790–415
TF-334	2715 ± 120	845	915–790
TF-1035	3125 ± 100	1270	1575–1280
TF-1127	3230 ± 95	1375	1685–1400
TF-1125	3365 ± 150	1515	1895–1545
TF-1033	3390 ± 110	1540	1880–1595
TF-1034	3420 ± 110	1575	1900–1660
TF-1031	3525 ± 135	1680	2145–1690
TF-1032	3600 ± 150	1760	2195–1750
Mahisdal, West Bengal—Early Iron Age			
TF-389	2565 ± 105	690	820–595
Mahisdal, West Bengal—Late Chalcolithic			
TF-390	2725 ± 100	855	920–795
Mahisdal, West Bengal—Early Chalcolithic			
TF-392	2950 ± 105	1090	1370–1035
TF-391	3235 ± 105	1380	1690–1400
Sohgaura			
PRL-179	3090 ± 130	1235	1580–1225
PRL-178	3190 ± 110	1335	1670–1375

Table 8 Radiocarbon Dates for Ahar

Site	Half-life 5568 b.p.	Half-life 5730 B.C.	CRD 1 σ B.C.
Ahar Ic			
TF-31	3130 ± 105	1275	1575–1280
TF-32	3400 ± 105	1550	1885–1645
Ahar Ib			
TF-34	3570 ± 135	1725	2175–1715
Ahar Ia, top			
V-57	3975 ± 95	2145	2660–2385
Ahar Ia, middle			
TF-37	3165 ± 110	1310	1665–1360
V-56	3715 ± 95	1875	2320–1955
Ahar Ia, lower			
V-54	3835 ± 95	2000	2425–2160
Ahar IA, bottom			
V-55	3825 ± 120	1990	2420–2150
V-58	3890 ± 100	2055	2555–2285

Source: Sankalia, Deo, and Ansari 1969:5.

Table 9 Radiocarbon Dates for Kayatha

Site	Half-life 5568 b.p.	Half-life 5730 B.C.	CRD 1 σ B.C.	References
Kayatha III, Malwa period				
(see table 12 for other Malwa dates)				
TF-397	3350 ± 100	1500	1785–1560	Agrawal 1982a:276; Wakankar 1967:45 differs with this list.
TF-398	3520 ± 100	1675	2015–1710	
TF-676	3160 ± 105	1305	1650–1350	
Kayatha II, Banas period (Ahar I)				
TF-679	3155 ± 130	1300	1675–1260	Ansari and Dhavalikar 1975:8
TF-401	3190 ± 105	1335	1670–1375	
TF-776	3455 ± 110	1610	1950–1675	
TF-399	3525 ± 100	1680	2100–1720	
TF-678	3530 ± 100	1685	2100–1720	
TF-777	3625 ± 95	1785	2185–1875	
TF-778	3550 ± 95	1705	2125–1745	
Pd. I/II				
Kayatha I, Kayatha period				
TF-405	3320 ± 100	1470	1760–1540	See Agrawal and Kusumgar 1969:189–90; Ansari and Dhavalikar 1975:8; Wakankar 1967:44–45.
TF-974	3485 ± 95	1640	1980–1690	
TF-780	3680 ± 95	1840	2305–1905	
TF-779	3685 ± 105	1845	2305–1905	
TF-781	3720 ± 105	2015	2325–1965	
TF-680	3850 ± 95	2015	2430–2165	

Table 10 Radiocarbon Dates for the Foundations of the Central Indian Chalcolithic

Site	Half-life 5568 b.p.	Half-life 5730 B.C.	CRD 1 σ B.C.
Daimabad III (Buff and Cream Ware)			
PRL-419	2980 ± 110	1120	1390–1085
BS-182	3130 ± 90	1275	1575–1280
PRL-428	3400 ± 110	1550	1885–1645
BS-177	3460 ± 100	1615	1955–1680
PRL-655	3490 ± 110	1650	1980–1690
Daimabad II (post-urban Harappan)			
PRL-657	3140 ± 100	1285	1585–1330
BS-180	3390 ± 100	1540	1880–1595
PRL-426	3600 ± 150	1760	2195–1750
A fourth date (PRL-420) reads A.D. 500			
Daimabad I (Savalda)			
PRL-429	3390 ± 150	1540	1910–1555
PRL-654	3460 ± 110	1610	1945–1675
BS-176	3590 ± 90	1750	2160–1850
Songaon I (Blotchy Gray Ware, Coarse Red Ware)			
TF-384	3415 ± 105	1565	1900–1575
Apegaon I (Savalda/Ramatirtha Ware)			
PRL-384	3520 ± 100	1675	2015–1710

Table 11 Radiocarbon Dates for Harappans in Gujarat

Site	Half-life 5568 b.p.	Half-life 5730 B.C.	CRD 1 σ B.C.
Rojdi Trench 45K, Middle levels (Rojdi B?)			
PRL-1088	3770 ± 125	1930	2420–1980
Rojdi Trench 45K, Lower levels (Rojdi A)			
PRL-1089	3865 ± 115	2030	2440–2180
PRL-1093	3920 ± 110	2090	2640–2305
PRL-1087	4010 ± 110	2180	2675–2515
PRL-1085	4020 ± 110	2190	2680–2515
Rojdi Trench 46L, Middle levels (Rojdi B)			
PRL-1282	3470 ± 140	1620	2000–1665
PRL-1281	3520 ± 110	1680	2015–1710
Rojdi Trench 46L, Lower levels (Rojdi A)			
PRL-1285	3740 ± 140	1900	2410–1945
PRL-1284	3810 ± 100	1980	2415–2135
PRL-1283	3980 ± 100	2140	2660–2385
Rojdi Trench 76L, Upper levels (Rojdi C?)			
PRL-1084	3700 ± 145	1860	2350–1890
Rojdi Trench 76L, Lower levels (Rojdi B?)			
PRL-1083	3875 ± 125	2040	2640–2160
Rojdi Trench B, Period I, Phase B, 1962–63 season			
TF-200	3810 ± 110	1975	2415–2135
Rojdi Trench C, Period I, Phase B, 1962–63 season			
TF-199	3590 ± 100	1700	2150–1850
Somnath Period III, Lustrous Red Ware			
PRL-19	3100 ± 160	1245	1590–1230
PRL-20	3340 ± 105	1490	1775–1550
PRL-91	3860 ± 165	2025	2560–2145
Somnath Period II, Prabhas Ware			
TF-1284	3465 ± 95	1620	1965–1680
TF-1286	3595 ± 90	1755	2165–1860
PRL-92	3830 ± 95	1995	2425–2155
Somnath Period I			
PRL-90	4240 ± 110	2415	3035–2780
TF-1287	4280 ± 105	2460	3065–2860
Lothal B			
TF-19	3650 ± 135	1810	2315–1865
TF-23	3705 ± 105	1865	2400–1895
Lothal A			
TF-135	3405 ± 125	1555	1950–1570
TF-29	3740 ± 110	1900	2340–1980
TF-133	3740 ± 110	1900	2340–1980
TF-26	3830 ± 120	1995	2445–2115
TF-27	3840 ± 110	2005	2425–2160
TF-22	3845 ± 110	2010	2430–2165
TF-136	3915 ± 130	2080	2655–2185
Surkotada IC			
TF-1307	3510 ± 105	1660	2000–1700
TF-1311	3625 ± 90	1780	2185–1875
TF-1294	3620 ± 95	1780	2180–1870
TF-1297	3635 ± 95	1790	2190–1880
Surkotada IB			
TF-1304 & 1309	3645 ± 90	1805	2195–1885
Surkotada IA			
TF-1295	3780 ± 95	1940	2410–2105
TF-1310	3810 ± 95	1970	2415–2135
TF-1305	3890 ± 95	2055	2555–2285

Note: Two additional dates can be attributed only to Surkotada Period I: TF-1301, 2005 ± 130 B.C. (2550–2125 B.C.) and PRL-85, 2315 ± 130 (2940–2540 B.C.).

Table 12 Radiocarbon Dates for Malwa Occupations

Site	Half-life 5568 b.p.	Half-life 5730 B.C.	CRD 1 σ B.C.
Navdatoli, Phase IV (Malwa Ware, Jorwe Ware, Coarse Red Ware)			
P-205	3294 ± 125	1445	1780–1415
Navdatoli, Phase III (Malwa Ware, Jorwe Ware, Cream-Slipped Ware)			
P-204	3449 ± 130	1600	1980–1650
Navdatoli, Phase II (Malwa Ware and a small amount of Jorwe Ware, Bichrome Wares)			
P-202	3503 ± 128	1660	2120–1675
P-476	4125 ± 69	2300	2890–2640
Navdatoli, Phase I (Malwa Ware, Bichrome Ware, Ahar Black and Red Ware)			
TF-59	3380 ± 105	1530	1875–1580
P-200	3457 ± 127	1610	1990–1660
P-475	3455 ± 70	1610	1905–1695
P-201	3492 ± 128	1645	2105–1670
Daimabad IV			
BS-181	2990 ± 100	1130	1400–1095
PRL-411	3230 ± 100	1375	1685–1400
PRL-412	3250 ± 110	1400	1695–1410
(PRL-411 is Malwa/Jorwe overlap)			
Barkhera			
PRL-111	3170 ± 105	1315	1660–1360
Apegaon II, Malwa/Jorwe			
PRL-382	3450 ± 100	1605	1945–1675
PRL-383	3450 ± 105	1605	1945–1675
Dangawada			
PRL-692	2900 ± 140	1040	1365–860
PRL-686	3110 ± 140	1250	1645–1235
PRL-691	3200 ± 120	1350	1670–1380
PRL-693	3280 ± 100	1430	1720–1430
PRL-690	3400 ± 150	1550	1935–1560
Eran			
TF-528	2878 ± 65	1015	1130–1020
TF-326	2905 ± 105	1040	1335–1015
TF-324	3130 ± 105	1275	1575–1280
P-526	3136 ± 68	1280	1555–1365
P-525	3193 ± 69	1340	1645–1400
TF-330	3220 ± 100	1365	1680–1395
TF-327	3280 ± 100	1430	1720–1430
TF-329	3300 ± 105	1450	1745–1520
TF-331	3355 ± 90	1505	1865–1565
Inamgaon			
BS-277	3078 ± 100	1220	1540–1240
TF-924	3225 ± 200	1370	1760–1325
TF-1000	3230 ± 80	1375	1685–1400
PRL-133	3230 ± 105	1375	1685–1400
PRL-59	3210 ± 110	1355	1675–1390
PRL-77	3310 ± 110	1460	1755–1530
BS-263	3310 ± 130	1460	1790–1420
TF-1001	3415 ± 90	1565	1900–1660

Table 13 Radiocarbon Dates for Jorwe Sites

Site	Half-life 5568 b.p.	Half-life 5730 B.C.	CRD 1 σ B.C.
Inamgaon, Period III Late Jorwe			
TF-995	1775 ± 125	A.D. 120	A.D. 30–420
BS-467	2740 ± 100	870	930–800
TF-923	2890 ± 170	1025	1360–845
TF-996	2930 ± 180	1070	1415–840
BS-463	2980 ± 110	1120	1390–1085
BS-487	3000 ± 100	1140	1405–1100
PRL-93	3020 ± 105	1160	1415–1215
PRL-94	3020 ± 115	1160	1415–1215
PRL-57	3050 ± 105	1190	1435–1230
BS-488	3050 ± 100	1190	1435–1230
BS-502	3050 ± 90	1190	1435–1230
BS-466	3060 ± 120	1200	1445–1235
BS-461	3070 ± 100	1210	1530–1235
TF-1330	3090 ± 100	1235	1545–1245
BS-500	3100 ± 90	1245	1555–1250
BS-489	3020 ± 100	1160	1415–1215
BS-486	3020 ± 100	1160	1415–1215
TF-1235	3135 ± 90	1280	1585–1330
BS-501	3160 ± 80	1305	1650–1350
TF-922	3205 ± 100	1350	1675–1390
BS-462	3310 ± 110	1460	1755–1530
BS-445	6050 ± 150	4280	5225–4865
Inamgaon, Period II Early Jorwe			
TF-997	1530 ± 105	A.D. 375	A.D. 395–600
PRL-78	2740 ± 115	870	930–800
BS-468	3120 ± 105	1265	1565–1265
PRL-76	3220 ± 110	1365	1680–1395
TF-1087	3260 ± 105	1410	1700–1415
TF-1085	3295 ± 115	1445	1745–1520
BS-103	3355 ± 105	1505	1865–1565
TF-1086	3385 ± 150	1535	1910–1555
Chandoli, Jorwe			
TF-43	2905 ± 100	1040	1335–1015
TF-42	3035 ± 115	1170	1430–1225
P-474	3099 ± 185	1240	1665–1105
P-472	3157 ± 68	1300	1570–1380
P-473	3184 ± 68	1330	1590–1395
Nevasa, Jorwe			
P-184	2545 ± 115	670	815–575
P-181	3106 ± 120	1250	1560–1255
TF-40	3110 ± 110	1255	1560–1255
Songaon, Jorwe Periods IIA–B			
TF-379	3150 ± 90	1295	1640–1340
TF-383	3185 ± 100	1330	1670–1375
TF-382	3195 ± 100	1340	1670–1380
TF-380	3230 ± 105	1375	1685–1400
Khed, Jorwe			
PRL-220	2900 ± 160	1035	1365–860
PRL-221	3040 ± 90	1180	1430–1225
Daimabad Period V, Jorwe			
BS-178	2950 ± 100	1090	1370–1035
BS-179	2970 ± 100	1110	1385–1050
PRL-656	3050 ± 150	1190	1550–1105

Source: Period designations for Inamgaon from M. K. Dhavalikar pers. comm., 1985.

Table 14 Radiocarbon Dates for the Southern Neolithic

Site		Half-life 5568 b.p.	Half-life 5730 B.C.	CRD 1 σ B.C.
Allchin Period I				
Kodekal	TF-748	4285 ± 105	2465	3150–2865
Palavoy	TF-701	3805 ± 100	1970	2415–2135
Utnur	TF-168	3875 ± 110	2040	2405–2020
	TF-167	3890 ± 110	2055	2550–2185
	BM-54	4120 ± 150	2295	2920–2535
Allchin Period II				
Hallur	TF-580	3560 ± 105	1715	2135–1755
Polakonda	BS-98	3255 ± 120	1405	1700–1415
Sanganakallu	TF-359	3400 ± 100	1550	1885–1645
	TF-354	3440 ± 100	1595	1925–1670
T. Narsipur	TF-413	3345 ± 105	1495	1785–1516
	TF-412	3645 ± 105	1805	2195–1885
Tekkalakota	TF-239	3395 ± 105	1545	1885–1645
	TF-237	3465 ± 105	1620	1965–1680
Allchin Period III				
Hallur	TF-586	3055 ± 95	1195	1785–1560
	TF-576	3280 ± 105	1430	1765–1405
Paiyampalli	TF-829	985 ± 105	A.D. 935	A.D. 860–1070
	TF-832	770 ± 100	A.D. 1155	no calibration
	TF-833	3215 ± 210	1360	1750–1270
Sanganakallu	TF-355	3435 ± 100	1590	1925–1670
Tekkalakota	TF-262	3460 ± 135	1615	1990–1660
	TF-266	3625 ± 100	1785	2185–1875
Transition from Neolithic to Megalithic				
Hallur	TF-573	2820 ± 100	955	1125–825
	TF-575	2895 ± 100	1030	1320–1010
	TF-570	2970 ± 105	1110	1385–1050
Paiyampalli	TF-349	3340 ± 100	1490	1775–1550
	TF-827	3570 ± 105	1725	2145–1760
Palavoy	TF-700	3390 ± 95	1540	1880–1595

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